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INDIVIDUALIZED ANESTHESIA*

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I am happy to discuss before the internists and surgeons of the Michigan State Medical Society the subject of "Individualized Anesthesia."

The surgeon owes the science of anesthesia a debt of gratitude. The surgery performed previous to the era of anesthesia was of a limited and minor character, performed upon a resisting and forcibly restrained patient suffering extreme agony. Since the advent of anesthesia and its evolution, it has become possible for the art of surgery to attain the high degree of efficiency and skill, so that, at the present date, the surgeon may explore with deliberation and dexterity practically every part of the anatomy of a quiet, relaxed or sleeping patient.

There should be no hesitancy in a full co-operation between the surgeon and the anesthetist. The anesthetist does not get a square deal, and neither does the patient, when he is requested to anesthetize a seriously ill patient of whose condition he has not been previously informed.

The anesthetic agent or agents, and the manner of their administration, must be adapted to the individual, to the pathology in question and to the various pathological conditions which may complicate the case. What type of individual is the prospective surgical patient? Is he robust, muscular, athletic, obese, or is he flaccid, inactive or emaciated? Is he neurotic and apprehensive or stable and calm? Is he a child? Is he in the prime of life or aged? What is the character of his pathology? Is it of a septic nature, does it involve some vital organ? Is it located in the head, on the face or neck, in the breast or abdomen? What other abnormalities, if any, complicate the pathology? Is it co-existent with pulmonary tuberculosis, toxic thyroid, organic heart disease, diabetes or nephritis? All of these various phases of the patient must be considered in the selection of the proper anesthetic agent and the method of its administration.

This comprehensive knowledge of the patient by the anesthetist can be obtained only by his careful study of the patient in conjunction with the internist and the surgeon in charge. The problem of the patient having been thoroughly studied, the surgeon and the anesthetist are in a position to determine the proper pre-operative preparation and the selection of the anesthetic which will be most suited to the individual and will allow the surgeon to perform the necessary operative procedure with the minimum of harm to the patient.

There is no single anesthetic agent which can be used routinely. The modern anesthetist should have at his disposal several anesthetic agents which he should be able to use with skill and experience. Skilled anesthetists are usually available in the larger medical centers, but this is not always true

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in some of the smaller communities. If there should be some one doctor in a community who has the natural qualifications and is interested in this specialty it would be to the advantage of both the surgeon and the patient to encourage him in order that he may develop his proficiency and experience. This doctor should visit the larger medical centers and receive instruction and experience, not only in the administration of ether, but also in the use of gas-oxygen, spinal and avertin anesthesias. If he is financially unable to acquire such training, it would be of infinite advantage to the surgeon to advance the necessary funds.

I will now briefly review some of the accepted anesthetic agents and describe some of their effects upon the tissues of the body, both beneficial and deleterious. The most common anesthetic agents employed today are ether, gas-oxygen, avertin, ethyl chloride, spinal and local infiltration.

Ether

Ether is still a very reliable, efficient and comparatively safe anesthetic agent when properly administered in selected cases. With the exception of sub-arachnoid block, no other anesthetic agent will produce the degree of relaxation in abdominal surgery, and this is particularly so in the robust, muscular, athletic, alcoholic and obese types. There is more nausea and vomiting following its use and therefore the intake of fluids and nourishment is delayed. It frequently lowers blood pressure by either depressing the vasomotor constrictors or stimulating the vasomotor dilators. It depresses the general vitality of the patient so that convalescence is somewhat retarded. Hemoglobin is reduced about three per cent and there is some cell destruction in the liver and kidneys. This is particularly so in prolonged anesthesia. No more ether should be given than each individual patient requires. Ether is an irritant to the respiratory tract and it is therefore contra-indicated in acute and most chronic diseases of the respiratory tract as in pneumonia, bronchitis, bronchiectasis and empyema of the pleural cavity. It is contra-indicated in nephritis and eclampsia. It liberates glycogen from the liver and therefore increases hyperglycemia, hence coma may ensue if ether is used in unprepared diabetic patients. It is also contra-indicated in patients who have severe liver damage. Ether should be avoided for patients who have previously experienced an ether idiosyncrasy such as excessive and prolonged vomiting. Its use is prohibited in the presence of an open flame or cautery.

Gas-Oxygen

Nitrous-oxide-oxygen and ethylene-oxygen do not produce so profound a degree of anesthesia as does ether. Ethylene is more potent than nitrous-oxide. Ether may be added to increase their efficiency. In abdominal surgery one cannot produce the same degree of relaxation with gas-oxygen as with ether. This is particularly true in the robust, muscular, alcoholic and obese types. The surgeon who wishes to employ gas-oxygen in abdominal surgery must be content with less relaxation and must be more gentle in his manipulation of the peritoneum and viscera. When there are no contra-indications for a general anesthetic, gas-oxygen can be used in practically every type of surgery and accompanying complications. It is non-toxic, produces no blood or other tissue changes. It does not irritate the respiratory tract and has no deleterious effect upon the kidneys or liver. It may produce a slight temporary increase in blood sugar due to a necessary degree of anoxemia. It is rapidly eliminated, and post-operative vomiting is greatly diminished. Fluids and nourishment are taken early and therefore convalescence is hastened. Patients do not feel so depressed and exhausted as after an ether anesthesia. Gas-oxygen stimulates respiration and circulation and sustains blood pressure due to the fact that it increases carbon-dioxide in the blood. Gas-oxygen is the best anesthetic agent to sustain blood pressure and therefore is indicated in the weak, aged and hypotensive patients.

Spinal Anesthesia or Sub-arachnoid Block

Spinal anesthesia or sub-arachnoid block has a definite place in the field of anesthesia. Its scope is limited to operations below the diaphragm. There is no other anesthetic agent which will produce an equal degree of muscular relaxation in abdominal surgery. This is particularly so in the muscular, robust and obese types of patients. It is a comparatively safe procedure in operations in the lower abdomen and the lower extremities. It is more hazardous in upper

abdominal surgery, since the upward extension may not be perfectly controlled, and the phrenic nerve and the accessory respiratory muscles may become involved. The safety of the spinal anesthetic depends upon the extent of the anesthesia and upon the person administering it. Some degree of dulling of the sensorium is necessary so that the patient may not be perturbed by the fear of being hurt, by the prolonged uncomfortable position on the operation table and by the noise of instruments and conversation. The pre-operative administration of some barbiturate plus morphine and hyoscine will produce a considerable degree of narcosis and amnesia and sleep at intervals.

Blood pressure is usually reduced by spinal anesthesia. The fall is greater in upper abdominal than in lower abdominal surgery. This reduction in pressure is due to a partial or complete blocking of the splanchnic sympathetics, a vasomotor dilatation in the vessels in the parts anesthetized and an absorption by the arachnoid vessels of the solution which thus enters the general circulation. The amount of novocaine absorption is in direct proportion to the dose injected. Surgical situations may arise when a spinal anesthetic might be almost essential, for instance when infiltration anesthesia would be insufficient in a case of an acute abdomen complicating pneumonia. The vigorous types of patients are the better risks, while the hypertensive cardiac, hypotensive, arterio-sclerotic, anemic, septic, aged and shocked are the poorer risks.

The drugs most commonly used are novocaine for operations lasting from one-half to one and one-fourth hours, pantocaine one to two hours, and nupercaine two to three hours or longer.

Ethyl Chloride

Ethyl chloride is placed between ether and chloroform in toxicity. It acts very rapidly. It should be used only in operations of very short duration where the anesthetic can be stopped when the stage of surgical anesthesia has been reached; for instance, incising an abscess or a paracentesis. An ethyl chloride-ether sequence will avoid the initial unpleasant effects of ether.

Avertin

Avertin or tribromethanol is used by some as a complete anesthetic agent. However, it is generally considered as a basal anesthetic requiring supplemental gas-oxygen or ether. It is a circulatory, respiratory and muscular depressant,—an effect that is considered to be due to depression of the centers of circulation and respiration. It does not cause any serious changes to the body tissues excepting slight transient depression of kidney and liver function. The glycogen content of the blood is increased accompanied by some acidosis. Its use is questionable in the presence of diabetes. It is detoxicated by glyuronic acid in the blood stream, and is eliminated entirely by the kidneys. It should not be used in severe kidney damage, as its elimination would be delayed and possibly prevented. Due to its depressant effect on circulation and respiration it is contra-indicated in patients who have a marked pulmonary obstruction, or who are feeble, anemic, cachetic or hypotensive.

The dose of a basal anesthetic, which depends on age, condition and metabolic rate of the patient, ranges from 50 to 100 mgm. per kilo of body weight. It is administered rectally in a two and one-half per cent properly prepared solution. We have never observed any great respiratory depression when the smaller doses are used. Ephedrin is beneficial both as a stimulant to sustain a falling blood pressure and as a precautionary medication to prevent a drop in pressure if administered just previous to the avertin.

Our most grateful patients are those who have received avertin anesthesia. The enema may be given in the room with or without the patient's knowledge. In the course of ten minutes the patient is asleep and remains so until a few hours after surgery. He then falls into a secondary sleep which may last for several hours.

We return the patient to the room retaining the airway until it is voluntarily ejected, which prevents the tongue from obstructing the pharynx.

Local Infiltration Anesthesia

Infiltration anesthesia should be used in all cases where a general anesthetic is contra-indicated. There are no contra-indications in its use; it should be used in the aged or in patients whose general condition is very poor.

Paregoric and Whiskey

Infants do not tolerate ether well. A few drops of a mixture of paregoric and whiskey (paregoric one-half to one dram, whiskey one to two drams) administered by mouth at frequent intervals before and during operation, produces a satisfactory degree of narcosis. This may be combined with infiltration anesthesia.

Pre-operative Sedatives

The pre-operative administration of sedatives, such as sodium amytal, nembutal, pantopon, morphine, morphine and hyoscine and avertin relieves the patient's fears and apprehensions and brings about a state of amnesia. They facilitate the induction and smoothness of the anesthetic and reduce considerably the amount of anesthetic required. When gas-oxygen is used, the oxygen per cent can be considerably increased. This combined use of sedatives, narcotics and anesthetic agents is termed "Balanced Anesthesia" by Lundy of the Mayo Clinic.

Based upon this brief résumé of some of the effects of these anesthetic agents upon the body tissues, I will try to apply these principles to some of the various surgical conditions with which we frequently come in contact. I would like to state at this time that when any anesthetic agent is recommended it is to be understood that there are no contra-indications in its use.

Head Surgery

When one operates on a patient in an unconscious or semi-conscious condition due to some trauma,—such as skull fracture or increased intra-cranial pressure, or from tumor or hemorrhage,—which requires head surgery, no anesthetic is usually required. If the patient's mental state is normal, morphine-avertin anesthesia supplemented by ether or gas-oxygen given by the intratracheal method would be indicated. The intra-tracheal technic assures free ventilation and allows the anesthetist to be removed from the surgical field. The supplemental ether may also be administered by means of the mouth hook or intranasal catheters. Morphine and hyoscine with or without a barbiturate may be used in place of the avertin.

Most of the face plastic operations can be performed under infiltration anesthesia or by the above mentioned methods.

Thyroid Surgery

The surgical thyroid cases may be divided into two groups: first, the simple adenoma; second, the toxic adenoma and the hyperplastic thyroid. In the simple adenoma, open drop ether or gas-oxygen can be used. I prefer gas-oxygen because the degree of anesthesia can be quickly lessened in order to ascertain any injury to the recurrent laryngeal nerve and also a cough or gagging reflex may be quickly induced. This reflex some surgeons desire before closing in order to develop any possible bleeding points.

Toxic thyroids require careful consideration. These patients all have some degree of tachycardia, may have a fibrillating heart and hypertension due to an overactive heart. Many of the milder cases stand surgery well; for them I prefer gas-oxygen anesthesia. Most of the toxic thyroid patients who come to surgery have had rest and Lugol's solution. The majority of these patients stand surgery well. These patients do not always respond properly to this pre-operative treatment when they are given an anesthetic. Crotti's[1] rule, I believe, is a safe technic to follow. It is somewhat as follows:

I. When a patient is being anesthetized the heart rate will rise to a given level. When the stage of surgical anesthesia has been reached, the pulse rate will drop to about where it was or a little higher but it will remain decidedly below the high level. That patient is a good surgical risk.

II. The heart rate will go up to a given level but instead of coming down when the stage of surgical anesthesia has been reached it will remain persistently at that level. That patient is not a good risk. The operation should be postponed.

III. The heart rate will jump up to a certain level and instead of coming down or remaining stationary it will continue to rise. "Do not operate, wait for a better chance."

The thyroid cases who have a decompensated heart must be given rest and digitalis before surgery is attempted. When recovery has taken place, they may be operated under open drop ether, gas-oxygen or local infiltration. All bad heart cases must be operated under local anesthesia.

Heart Disease

A cardiac murmur does not necessarily mean that the person has heart disease, since murmurs may be heard in eight to ten per cent of patients who show no other evidence of heart disease. When a cardiac murmur is heard, a careful search should be made for definite signs of organic disease, such as hypertrophy, dilatation, thrill, râles, edema, definite signs of mitral stenosis or aortic insufficiency, changes in blood pressure, or signs of angina. If one or more of these signs are present a definite diagnosis of heart disease may be made. A history of rheumatic fever will aid in the diagnosis.

Older people who become easily fatigued, show evidence of shortness of breath upon slight exertion or even when at rest, and have attacks of fibrillation, may have grave myocardial disease. A physical examination may show no evidence of hypertrophy, dilatation or heart murmur. Such cases are always bad surgical risks and should receive a local anesthetic.

The valvular heart case, which gives no past or present history of a congestive heart —such as, dyspnea, râles in the chest, enlarged liver or swelling of the lower extremities,—can be given a general anesthetic. All patients who give evidence of a decompensation should receive a local anesthetic. After rest and treatment, they may receive a general or local anesthetic.

Hypotensive or hypertensive heart cases should be given an anesthetic such as gas-oxygen or local infiltration, which will sustain the blood pressure and prevent brain anemia.

Diabetics

A diabetic patient is not necessarily a bad surgical risk but he is an exceedingly bad risk if this condition is not known. An anesthetic administered to an unknown diabetic may result in a catastrophe.

A routine examination of the urine is absolutely necessary before any patient is operated. The laboratory report should be checked by the anesthetist.

A known diabetic, who has been properly prepared and whose carbohydrate tolerance has been increased, is a good surgical risk and should be operated under gas-oxygen or spinal anesthesia. If these agents are not available, he may be given ether, but I would advise that he be given 20 to 25 grams of glucose and a small dose of insulin two or three hours before surgery.[2]

The glycogen content of the liver of a diabetic is low and the liver does not retain glycogen long; therefore some carbohydrate fortified by insulin should be used preoperatively. When a known untreated diabetic comes to surgery that is not imperative, it would be better to delay the operation in order that the patient may receive proper treatment. If the operation is imperative and the surgery would ameliorate the hyperglycemia, as in acute or chronic infections, infected gall bladder or hyperthyroidism, he may be operated upon at once under a local, gas-oxygen or spinal anesthesia. His liver glycogen content should be built up by the pre-operative administration of glycose fortified by a small dose of insulin. This treatment should be repeated every three or four hours for the first forty-eight hours after surgery. Only small doses of insulin should be given to prevent hypoglycemia. The blood sugar should be estimated twice daily. Leg amputations for diabetic gangrene under a low spinal anesthesia are very satisfactory,

Hypertension

Hypertension is not a definite pathological entity but is an expression of changes taking place in the circulatory system. The nature of these changes is definitely known in acute and chronic nephritis and generalized arteriosclerosis with the accompanying albuminuria, casts, hypertrophied heart, etc. In essential hypertension we have a hypertension without any apparent kidney or arterial disease associated with it.

It is a generally accepted fact based upon the opinions of various investigators that there is present a more or less generalized arteriolar-sclerosis which is most marked in the kidneys, brain and spleen in essential hypertension. Some initial irritant or toxine is probably responsible for these arterial and arteriolar changes in both types of hypertension. We must bear in mind the fact that the hypertension produced by these lesions is compensatory in character. It is nature's provision to assure an adequate functional supply of blood and oxygen to those organs whose blood supply has been diminished by the decreased caliber of the sclerosed arteries and arterioles. It is essential that this compensatory hypertension should not be disturbed to any great degree

but should be maintained if possible. If this tension is reduced in a marked degree, an anemia and accompanying anoxemia of the organs involved will ensue. This is particularly true of the centers of respiration and circulation in the medulla. When these centers become markedly affected by anemia and anoxemia, a failure of respiration and circulation may occur. This anemia and anoxemia must be relieved within a short period of time or a fatality may follow. Gas-oxygen and infiltration anesthesia are the best anesthetic agents to maintain this tension.

Intestinal Obstruction

The degree of hazard in intestinal obstruction cases depends upon the cause of the obstruction and the duration of its existence. If the patient is seen within a few hours after the onset of the obstruction, his condition is not so serious and he stands an anesthetic fairly well. If the obstruction is caused by a strangulated hernia the operation may be performed under a local, general or spinal anesthetic. If the obstruction has been present for a few days, the condition becomes extremely hazardous. These patients will have become dehydrated from vomiting, will have an acidosis and will show great depression. The dehydration and acidosis must be treated. A stomach lavage must be given and a Levine tube left in the stomach in order to drain off the reverse peristaltic fluid. The stomach must be emptied and kept empty if a general anesthetic is given, or the infectious stomach contents may be aspirated. Seriously sick patients should be operated upon under morphine with a local anesthetic, and, if required, nitrous oxide plus a high percentage of oxygen may be added. The earlier cases with a normal blood pressure may be advantageously operated under a spinal anesthetic, which assures excellent relaxation. The spinal anesthetic gives tone to the musculature of the bowel and increases peristalsis, thus relieving the bowel distention. Spinal anesthesia should not be used in the presence of a perforation of the bowel, since the increased peristalsis will expel more intestinal content into the abdominal cavity.

Prostatectomies

Almost all of the prostate cases which come to surgery are in old men. Their kidneys are usually damaged because of retention hydronephrosis and ascending infection. These patients should not receive ether. A local anesthetic should be used for the supra-pubic drainage. The prostatectomy or trans-urethral resection is satisfactorily done under a low spinal anesthesia. If the kidneys are not seriously damaged, avertin supplemented with gas-oxygen may be used.

Summary

1. No one anesthetic agent can be used routinely.

2. Anesthetic agents used are ether, gas-oxygen, avertin, spinal and infiltration.

3. The anesthetic should be adapted to the individual, to the pathology and to the complications.

A. The behavior of the heart of a toxic thyroid while under an anesthetic is an important factor in determining the operability.

B. Hypertension is a compensatory provision and should be maintained as nearly as possible during surgery.

C. The safety of anesthesia for a diabetic depends upon the glycogen content and its maintenance in the liver and proper postoperative treatment.

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PHYSIOLOGICAL POSTURAL DEFORMITIES IN CONTRAST TO PATHOLOGICAL POSTURAL DEFORMITIES*

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A few years ago at the American Medical Association meeting in Minneapolis I was very much impressed by a paper by Sweet et al. presented before the Pediatrics Section, dealing with normal postural changes in the developing child. The authors demonstrated the bow-leg tendency of normal infants, the knock knee appearance of the two-year-old child and the lordotic spine associated with the pendulous abdomen of the three-year-old child as normal developmental deformities associated with alteration of function and position of the body in the transition from a helpless infant to the active independent ambulatory child. These observations agreed with my clinical experience and I felt they were sound.

In frequent crippled child clinics held in local communities, I have been impressed, after advising correction of a marked genu varum or valgum deformity, by the mother of the patient bringing forward an older child with straight legs saying, "Her legs were more crooked than this child's, but she outgrew it."

Quite commonly in our hospital clinics older children are brought in with a congenital deformity, such as a congenital dislocation of the hip, which should have been corrected earlier in life. They answer the query, "Why didn't you bring the child in earlier?" by the statement, "My home doctor said the child would outgrow the deformity." Undoubtedly the doctor's advice was based on his clinical experience and recognition of the value of that great physician, "Time." Experience teaches that there are deformities appearing in the growing child which disappear as growth continues. It is recognition of these deformities convertible by growth and time which has led the parents and doctors to false hope in correction of pathological deformities.

There is sufficient evidence to warrant acceptance of the development of physiological deformities, but are we well enough acquainted with these normal deformities to distinguish them from pathological deformities? It is essential that we are, as the pathological deformities tend to become more marked or do not respond as readily without treatment. It would be unnecessary to treat a physiological deformity, whose only treatment need be the normal development of the child. I must confess I find myself inadequately prepared to discuss these physiological deformities from personal observation. My chief purpose in this paper is to learn from you in discussion how much is known about the physiological deformities, and to stress the importance of early recognition of the abnormal deformities.

My chief concern about the normal growing child naturally centers in his posture. In my clientele, both at the Henry Ford Hospital and the University Hospital, it is apparent that the framework of the child has not been examined by the parents or the doctor from the time that they were old enough to dress themselves. It is rare that we have a child referred to us by a doctor or parent for postural study. In larger districts, where routine school examinations are held by so-called orthopedic nurses, we have large groups of children referred with marked postural changes, and frequently with marked structural scolioses of many years duration, which the parents admit they had never noticed. It is time that competent examination of our young children for postural deficiencies be made routine in all our schools. Statistics of studies of large groups of school children in other countries shows a high frequency of scoliosis, varying from 10 to 26 per cent. Examination of entering freshmen at Yale and Harvard showed postural deformities of varying degrees in as high as 85 per cent of the students. In this latter group many of these had mild deformities, but a large percentage physically were unfit for army qualifications.

We should, of course, be thoroughly conversant with the normal or physiological

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postural deformities of children if they occur. From my observation these deformities are more apparent than real. The so-called bow legs of the infant are generally not an actual bowing of the bone as one can demonstrate by x-ray, which will show a perfectly formed tibia. It is due, rather, to the lack of development of the muscles of the leg, particularly the posterior group associated with the enlarged lower epiphysis, giving an apparent bowing. A simple test will readily differentiate this apparent bowing from a true deformity. If there is a true bowing of the legs when the knees are in extension with the internal malleoli of the ankles touching, there should be a space of varying degree between the condyles of the femora, dependent upon the extent of bowing. In these infants the condyles approximate each other in this test.

The genu valgum, which develops about two years of age or shortly after the child has become ambulatory, is an actual mild deformity most probably produced by the wide base used by the child in his uncertain gait. Here again a simple test measures the extent of the deformity. With the knees extended and the internal condyles approximated, the internal malleoli are separated to a greater or less extent, dependent upon the degree of knock knee. One or two inches separation may be regarded as a mild deformity. Usually this deformity disappears by the time the child is four years of age, but if it is associated with other postural deformities, particularly pronation of the feet, it may be persistent if left untreated. With my present limited knowledge of these physiological deformities, I find it hard to differentiate the genu valgum of this type from the pathological type.

The lordosis and pendulous abdomen of the three to four-year-old child is a compensatory effort to maintain balance in the upright position, and this deformity disappears normally as the child grows older and more adapted to the upright position.

It is quite probable that these deformities will be outgrown, or disappear as the child grows older. To a certain degree that is also true of some of the pathological deformities, but in general the latter will respond much more certainly and completely under treatment.

The more common postural deformities abnormal to the growing child should be recognized early, for early treatment gives the more certain assurance of correction. I will briefly relate the more common of these deformities and outline their treatment.

Pronation of the feet, associated with the maintenance of a well-formed longitudinal arch, is quite commonly seen in the developing child. One may subdivide the pronated foot into three main types:

1. The congenital flaccid flat foot.
2. Contracted heel cord.
3. Accessory scaphoid.

The congenital flaccid flat foot is distinctly familial. This type of flat foot is erroneously termed, as generally the longitudinal arch is high or well preserved. It is an extremely weak foot which pronates so markedly on weight bearing that the foot resembles a marked flat foot. Ligamentous structures are so relaxed that more than normal excursion of motion of the articulations of the foot are possible. It is a limp or flaccid foot. This type of deformity appears as soon as the child starts weight bearing. It is easily recognizable. Corrective shoes do not prevent the deformity, because the counter of the shoe breaks down and does not hold the heel in a corrected position. For this type of foot we have found the Whitman steel foot plate, which grasps the os calcis, holding it inverted, the best means of preventing stretching of the ligaments until the child is old enough to develop the muscles of the foot and ankle. When exercises can be initiated we use the crooked or Thomas heel and use the Spitzy method of strengthening the inverter muscles. This ingenious method consists of placing a marble or rubber ball just beneath the navicular tubercle and holding it in place by a strip of adhesive. The diameter of the ball is such that if the foot pronates it digs into the navicular, and consciously at first the patient contracts his inverters. Later he subconsciously maintains tonicity of this group of muscles and then the ball may be discontinued.

Many children from five years on develop an apparent flat foot, who have in reality a high arched foot, but due to a shortened heel cord, the foot cannot go beyond a right angle in dorsiflexion or in an inverted position, but it can if the foot pronates. They have the splay foot attitude of the flat foot as a result. This deformity is corrected by stretching exercises

for the heel cord, or, if resistant, by a tenotomy of the Achilles tendon. The crooked heel or the Whitman foot plate aids in the treatment.

The third type is generally seen about ten years of age. The attention of the parents is usually directed to what they call a second ankle bone. The tubercle of the navicular is extremely prominent and the foot, though the longitudinal arch is generally high, is markedly pronated. Kidner has called attention to this deformity produced by the development of a secondary navicular bone which is not attached to the main bone, but takes a large part of the force of the posterior tibial tendon which is attached to this free fragment from its normal pull on the medial part of the foot. In time this free bone tends to unite to the navicular proper, after which the foot deformity may be corrected, but operative fusion as advised by Kidner will more certainly cure this type of deformity.

There are many other types of deformities of the feet seen in children, but this group serves to illustrate a group of abnormal or pathological deformities which the child will not outgrow, but require treatment if a satisfactory functioning foot is to be obtained.

I have not time to discuss the abnormal or pathological deformities producing bow legs or knock knee, other than to say it is true that time and growth will tend to correct the deformities, but more certainly will correction be obtained by treatment, generally non-operative, but in the more severe cases by operative procedure.

The value of routine examination of the growing child's framework is to my mind excellently stressed by the early recognition of congenital dislocation of the hip in northern Italy. Putti states that congenital dislocation of the hip is so common in northern Italy that the mothers have learned to recognize this congenital deformity in six-months-old infants by the alterations of the normal skin folds about the hip. The importance in the end-result of early recognition and treatment of congenital dislocation of the hip cannot be stressed too much.

It is equally important that postural deformities of the back and shoulders be recognized early. A study of the incidence of postural defects in pre-school children at the Merrill-Palmer School demonstrates that round back, winged scapulæ, lordosis and forward head appear in relatively few children at two years of age, but were present in children of four or five with a frequency of 34 to 48 per cent. From their studies it seems reasonable to assume that these faulty attitudes appear after the second year and increase in degree as the child grows older. These studies seem to contradict the optimism expressed by Sweet et al., that these deformities tend to disappear as the child grows. It is only recently that opportunity has been afforded to study statistically the posture of these pre-school children, so it is too early as yet to obtain information as to what happens to these same children past five years of age.

Previous statistical postural studies of school children in various countries demonstrate, however, a relatively high frequency of postural deformities. The independent observation to which I have already referred, of Cook and Brown of Yale and Harvard entering classes, showed around 85 per cent postural deformities. The higher incidence of postural deformities in this older group argues against the thesis that these deformities disappear with growth.

The importance of these postural deformities may be over-stressed, but the possibility of their leading to a more serious lesion must be considered. The previously mentioned studies of school children showed a high incidence of lateral curvature of the spine, varying from 10 to 26 per cent. Although scoliosis may be produced by a number of factors, about 85 per cent of the cases of scoliosis, according to Kleinberg, are idiopathic or of unknown origin. Although Lovett and others have expressed the opinion that postural deformities of the spine were not frequently the cause of the structural scoliosis, there is sufficient reason to feel that it is this group of children with the rounded backs or lordotic spines who may prove to be the pre-scoliotic. Certainly they have already demonstrated a tendency to *deform* and should be regarded as the potential group from which the 10 to 26 per cent of scoliotics will occur.

Investigation of the ultimate outcome of this group would prove of the greatest value in the treatment of scoliosis. I know of no statistical study to prove or disprove this theory. It is one well worth making.

The usual age at which we first see the

scoliotic for treatment is about 12 years. By that time there is generally a well marked structural deformity of the spine, which is most resistant to any attempts at correction. The keynote of the present form of treatment of structural scoliosis is based upon the principle of forcibly moulding the plastic, growing bones of the spine into a corrected position, after which exercises to strengthen the musculature to maintain correction are employed. Recently, the difficulty in maintaining correction once it has been obtained has been recognized and fusion operations of the spine have been performed with the child still in the corrective plaster. This procedure has been widely adopted as the accepted method in this country. We have used this method as intelligently as we knew how and are greatly disappointed so far with our after-results. It is true that many of our failures may be due to faulty technic, but they have not been satisfactory.

I feel that for centuries too much attention has been focused on the treatment of the scoliotic, whereas our hope lies in the discovery of the prescoliotic and in devising methods to prevent his going on to scoliosis. How to do this I do not know, but if the same amount of time and study now expended on the treatment of the scoliotic could be turned to the study of our school children between the ages of five and ten, which is the formative period of the scoliotic, a great step forward in our knowledge of the etiology, and means of prevention of this deformity could be made.

In conclusion, I have attempted to stress in this paper the importance of recognizing a deviation from normal in the growing child's structural framework. Without certain assurance that such a deviation is physiological and correctible by growth, one should regard a deformity as abnormal, and early in its appearance attempt to correct it. The pathological deformities do not tend to correct themselves as the child grows, but rather may be the precursor of more serious difficulty.

IMPORTANT INTEGRATIONS OF THE MEDICAL SCHOOL

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Medical education concerns itself with creative measures to improve inheritances, prevent disease, alleviate suffering, and give guidance from sickness to health. It is a disciplinary training in the art and science used to maintain the human mind and body in a state of normal health and happiness.

There are three related parts in the assemblage of the present standard of medical education, as required by the Association of American Medical Colleges:

I. The pre-medical studies.
II. The undergraduate school.
III. The hospital.

I. The Pre-medical Studies

This preparatory work should not be regarded as an isolated problem of medical professional training, but as an integral part of the whole system of higher education. There are certain disadvantages to be considered in a program of study that centers too exclusively upon subjects closely allied to medicine. For example, deficiencies in English may easily prove a greater handicap than deficiencies in preliminary scientific subjects.

The best training results from selection of fundamental subjects, and the student should not be permitted to make the mistake, as is so frequently done, of piling up quantity in credits at the expense of quality. A Bachelor's or Master's degree may not be as good an indication of probable success in the medical course as a fine, well balanced record covering but two years of college work. The data collected by Secretary Zapffe[16] from seventy-nine United States medical schools amply support this point. The late President Burton once said that college credits are often piled up like

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so many sticks of wood—so long, wide and high for the cord of what proves to be soft wood.

The tremendous numerical increase of students in United States colleges naturally augments the number applying for entrance to medical schools. With a larger group of applicants, it follows that more discrimination in selection will obtain. The rejections reported in the Association Journal in January, 1934[17] reached 26.1 per cent of the total applications.

In 1933, there were fewer applicants with minimum entrance requirements of two years college work, but this group had the smallest percentage of encumbrances of all the groups, on the basis of college preparation. It is easy to conclude that the students with minimal requirements must have had high quality of work scores and were more strictly selected.

The largest percentage of clear records obtained in seventy-five schools was made by the A.B. group. The failures in this group reached only 8.0 per cent. The B.S. group ranked second, and the Ph.D.'s did not do so well. Zapffe, in giving the above figures, concludes that "the best preparation for the study of medicine is the pursuit of studies leading to the A.B. degree; more culture, less science."

Observations covering a period of more than thirty years have shown that at least 25 per cent of every entering class fails to graduate. Economically this represents a great loss to students and schools, much wasted effort, and time misspent.

In 1932, 7,357 applicants had been accepted and 4,923 refused by seventy-eight schools in the United States and Canada. By the end of the freshman year, 14 per cent of the entrants had been dropped.

Prevention of fatalities is most effective in two ways: first, as regards decisions to study medicine; and, second, in selection of those best fitted. The Indiana State Medical Journal[7] aptly put it this way: "A decision to study medicine should be held until a liberal arts degree is obtained. Then there should be but one legitimate reason for studying the art and science of medicine, and that is a burning desire to be of service to one's fellow man. If this desire, like Banquo's ghost, will not down or let the pilgrim sleep, or eat, or live in peace, then, provided he has health, brains, and will, he may be considered one of the elect."

This challenge is being answered, for in 1932, 52.3 per cent of the students entering 79 medical schools held Bachelor's or other degrees, and only 16.5 per cent had less than three years pre-medical work.

The Bureau of Economics[2] of the American Medical Association is authority for the information that "approximately 1,000,000 persons from the ages of 17 to 24 are in attendance at institutions of higher education during four to six years." Of this group, between 0.8 and 1.36 per cent are applying for entrance to the study of medicine; and they are coming largely from metropolitan centers. In New York State, Pennsylvania and Illinois, the proportions were 21.5 per cent (of the total for all states), 9.7 per cent and 7.1 per cent, or nearly 38.3 per cent from three states. New York City supplied nearly all of the 21.5 per cent of applicants. This gives the suggestion that the larger cities are very likely to furnish most of the pre-medical students.

At Wayne University College of Medicine, in the classes of 1935, 1936, 1937, 1938, and 1939, a total of 412 students was registered and of this number 350, or 87 per cent, came from the city of Detroit and its suburbs.

The 1935-1936 catalog of this college states the entrance requirements, as follows: "At least three years of not less than 32 weeks each, aggregating not less than 90 semester hours of credit, earned in a college of arts and sciences which is on the approved list of the American Medical Association, or the credits of which are accepted at par by the state university of the state in which the student is a resident. These must include: physics, 8 semester hours; chemistry, 12 semester hours (including 4 hours of organic chemistry); French or German, 12 semester hours; zoology, 8 semester hours; English, 12 semester hours; and normal psychology, 3 semester hours."

"The remaining hours must be filled by electives of which physical chemistry, additional biology, additional English, Greek, and as much work as possible in social science, economics, and history are preferred."[14] The catalog also states that "every student registering in the College of

Medicine who is not a college graduate is required to apply for an academic degree, the same to be conferred by an approved college of arts and sciences, upon the satisfactory completion of the first year of work in the medical school or later in the medical course, at the discretion of the college conferring the degree."

The foregoing program for the first year in the medical school could be appropriately designated a trial or elective medical science course. All candidates for the medical degree who elected to do the full first year's work could be passed upon at its conclusion, providing that adequate credits had been acquired and that their fitness for medicine was satisfactory. The objection can be raised that unless this year is regarded as an oportunity for broad cultural science training, it will not serve the best interests of either the elected or rejected students. The point is well taken due to its psychic implications. *This year should be designated primarily as the terminal year in the arts and science course, and secondarily as the initial medical period.* A truer perspective of the medical course could thereby be obtained and a decision to discontinue medicine would not be stigmatized.

Some original data concerning decisions to study medicine have been gathered at Wayne University College of Medicine. Two questions were asked of 314 students: How did you become interested in the study of medicine? And, how long and how intently was your attention fixed upon a medical career before you began medical studies?

The answers to the first question summarize as follows:

5 gave no answer.
8 did not know.
19 were interested by parents and friends.
1 became interested through dentistry.
8 were influenced by medical literature.
21 attributed personal or family illness.
134 from personal contacts with physicians.
112 claimed their decisions were from personal choice.

Analysis of the above answers shows that environmental factors influenced 57.9 per cent and deliberate choice was made, without stated reasons, by 35.6 per cent. There were 5.4 per cent who had no reasons to give for their choice.

The groupings of the answers to the second question amplify the information given in response to question one, by stating the time taken, or period chosen, in which the decision to study medicine was acted upon:

11 students took two to twelve months.
57 decided after two to five years deliberation.
57 considered the question during six to ten years.
7 stated they had been considering a medical career for eleven to fifteen years.
95 made their decisions after completing their high school work.
36 decided while in high school.
12 reached decisions when they were in literary college.
30 answered that they had always wanted to study medicine.
8 had no knowledge of any sustained desire for a medical career.

The above figures tend to show that 89.9 per cent of the group gave serious and sustained thought to their choice of medicine, while 9.1 per cent made a sudden or haphazard decision.

The percentage of scholastic failures in Canadian and United States medical colleges has remained stationary, at approximately 15 per cent of the total admissions. It is highly probable that the answers given above by Wayne University students point definitely to some of the reasons for these failures.

The question has been raised: Why have concern over failures when the "enrollment in colleges and universities has increased seven times in the period from 1890 to 1930, which is fifteen times as rapidly as the population increase during the same period."[3] The answer is readily at hand. It is pathological to have failures. It is just as natural and just as reasonable for students and their teachers to desire academic success, as it is for patient and physician to strive for curative success. In both instances, greatest stress must be put upon preventive efforts.

The medical profession is not the only group concerned with overcrowding. President Walters[13] of Cincinnati calls attention to the profession of law, which has one lawyer for every 762 persons, or 131 per 100,000 of population for the country as a whole. University and college teachers number one to every 14.5 students in the United States. At Oxford University, England, the ratio in 1928 was one to 16, and at Cambridge one to 15.6.

The engineering profession in 1930 had one engineer to every 425 persons, or 231 to 100,000 of population for the country as a whole.

The medical profession in 1932 had one physician for every 852 persons, or 116 for each 100,000 of population. Professor Clark, in his book "Economic Theory and Correct Occupational Distribution," 1931, discusses the danger of limiting physicians, lawyers, engineers, dentists, and architects, and adds: "The plumbers, bricklayers, and carpenters know they are overcrowded."

Laborers are too numerous for available jobs. Farmers are too numerous, and they raise too much grain, too many hogs, and too much cotton. Yet withal, the poor continue to starve. The sick and suffering are unrelieved, and prevention of disease is not yet accomplished. If young men are to be kept from entering the medical profession, and other doors, according to reliable information, are also closed to them, where will they go?

II. The Undergraduate Medical School

In the summary of the 1932 Report of the Commission on Medical Education, this appropriate comment is made: "The hope of presenting the entire subject of medicine satisfactorily in the usual course must be abandoned as an unnecessary and futile endeavor, because no individual can be expected to master all phases of medicine. Furthermore, many parts of the subject cannot be taught by the faculty; they must be learned by the student through actual experience. It is an axiom, that all true education is self-education. This immediately makes the student the unit of education, not the courses, the credit hours, or the faculty."[4]

The distinct shift in many medical schools is in the direction of individualizing instruction, discontinuance of the rigid class system and uniform time schedules. The trend is to use small teaching sections, personal contacts between students and instructors, provision for a reasonable amount of free reading time, individual work, and a reduction in the amount of lecturing. "These changes are in recognition of the fact that the crucial element is the individual student upon whose character, attitude, preparation, ability and industry so largely depends the result of medical training."

When one surveys the literature recently created, especially that by college presidents,[12] directors of bureaus,[2] deans of medical schools[9,10] and others,[15] there follows an impression that medical school curricula must soon undergo radical changes and adjustments that are to be quite revolutionary. Wilbur[15] states that "the mechanics of school administration have been satisfactorily solved," but teaching cannot be carried out in the old way. "The medical curriculum is overloaded; there has been more engorgement than digestion. We must rid ourselves of the antique, the obsolete and the unimportant in our medical courses."

A good start may be made in this reform by going to the basic subjects—anatomy, physiology, biochemistry, bacteriology and pathology. It has been duly estimated that 50 per cent of the allotted hours in these subjects could be appropriately devoted to applied or clinical application work. At Wayne University, in the department of pathology, reduction has been made in the microscopic slides studied, and added attention is being given to gross changes, case histories, and practical discussions by the students and instructors concerning all phases of the subject represented, and including the anatomy, biochemistry and physiology. A liberal allotment of time is given to clinical pathology, commencing in the second year. Living material, which lends itself well for class inspection, is being used. The enthusiasm of students for the latter work is inspiring.

Certain correlations are being made with the radiology and internal medicine departments, by having guest instructors occupy a limited number of hours in the pathology schedule. The results of this experiment in division and correlation of instruction have been highly satisfactory.

Who would question the value of having a member of the department of anatomy attend autopsies and share some of the pathologist's time in giving an appropriate twenty to thirty minute talk and demonstration upon fresh, pliable, and undistorted tissues?

How appropriate it would be in the clinical study of a patient problem in functional pathology, to have the physiologist, pathologist and internist pool their interpretations before a student group; or in the interpretation and differentiation involved in mixed infections and toxemias, profitable discussions could be carried on by the bacteriol-

ogist, biochemist, pathologist, and internist or surgeon. This doubtless would result in both student listeners and instructional groups having to extend their respective horizons.

The objection will be made that this is too elastic a program and available time is lacking; but this objection has been overcome repeatedly where ideal instruction is approached or attained. Deliberate planning is required to make such work a brilliant success.

It is the general consensus of opinion in recent literature that the student should be constantly taught to rely upon himself and fully to realize that his prepared food days are over. He should be urged to search the literature and learn first hand the sources of written knowledge. Verbal instruction should point the way through discussions, preferably in small informal groups. Instructors should avoid displaying their personal knowledge and artistry and should find peculiar inspiration in developing both of these attainments in their students.

One of the greatest temptations that constantly besets the instructor, is to yield to the thought of saving time and patience by doing for the student what he can soon do for himself. A second problem of serious importance is the giving up of quantity in the study program for quality or mastery. It is doubtless true that a new graduate in medicine and surgery who has drilled himself in a few subjects will succeed more quickly and surely than will his fellow who has a wide smattering survey of all the curricular subjects. Two examples will suffice, e.g.: in medicine, mastery of the respiratory tract diseases would equip for most of the ailments going to the general practitioner; in surgery, a thoroughgoing knowledge of the abdomen would encompass 90 per cent of its usual problems.

In the field of medicine, there is an incomparable opportunity for the practice of pedagogical ideals on the part of the teacher and the practice of the art of learning on the part of the students. It is astonishing how little well planned and disciplined attention is given to these closely linked subjects. In a questionnaire answered by 314 medical students in Wayne University:

150 or 47.7 per cent had no technic for study when they began their medical course.
105 or 33.4 per cent had no system of association to aid the memory.
138 or 43.9 per cent admitted training the memory almost entirely by repetition.
79 or 25.1 per cent did not have any plan for reading assigned texts.
39 or 12.4 per cent had no method for concentration.
182 or 58.2 per cent stated they had not received any specific instruction on "how to study."

To the question, What are your best incentives for study?

138 or 43.9 per cent answered—interest in the subjects.
56 or 17.8 per cent replied—examinations or quizzes.
28 or 8.9 per cent gave credit to environment.
26 or 8.2 per cent only, were willing to credit their teachers as incentives.

A miscellaneous lot of answers credited necessity, curiosity, pride, reward, family devotion, and fear as their main stimuli for study.

To the question, Do you favor no final examinations?

148 or 47.1 per cent answered yes.
155 or 49.3 per cent favored final examinations.
11 or 3.5 per cent were indifferent.
28 or 8.9 per cent commented upon overemphasis of final examinations.
27 or 8.9 per cent preferred interval examinations.

To the question, Do you favor a coaching system of instruction?

234 or 74.5 per cent answered yes. This was the highest agreement reached upon any answer.

The question, Will you offer constructive suggestions of value in aiding your medical studies? called forth seven answers pertaining to examinations, four in regard to facilities, twenty-seven pertaining to student desires, eleven concerned teachers, and thirty-eight referred to teaching methods and courses.

There was no impressive agreement in the suggestions offered. The following include the majority of similar suggestions:

1. Substitute frequent quizzes and examinations for the final examination and reduce the significance of the final examination.

2. Provide better working facilities for the students by increasing available library hours, have more study rooms, and permit work in laboratories during spare time.

3. Reduce existing formality between professors and students. Continue and increase extra-curricular programs. Correct late arrivals and absences of lecturers.

4. Reduce the student's clerical work. Have better organization of the courses given. Provide more illustrative materials. Increase the quality and organization of lectures given. Give greater

emphasis to important details and practical applications (this is the most frequently given suggestion). Do not show clinic patients who must be kept covered with a blanket.

III. The Hospital

As an integer in the undergraduate medical educational program, the hospital is a humanized public service laboratory where patient and physician meet for one ultimate practical purpose, which is relief from suffering and restoration of health.

The student enters upon this phase of his training with a storage of subconscious values and a conscious equipment of knowledge, yet undisciplined and very incompletely organized. He is self-conscious and has not reached a degree of certainty as to "which" comes before "which." When the test of application arrives, there is confusion to be dispelled. All of the fifteen or more modal senses have conveyed afferent impulses to the cerebral association centers through four years of fact finding exercises, but each of these impulses has not completed the reflex arc in efferent reactions.

Much of the fundamental basic knowledge contacted in the pre-clinical years has become disseminated, because clinical associations in anatomy, physiology, biochemistry, bacteriology, psychology and pathology were inadequate.

The clinical teacher is necessarily burdened not only with disciplining the student in the art of medicine, but with a tedious review of fundamental scientific facts. He becomes a coach who must have genius for organization and practical application. He must review with the student dimmed and poorly mastered facts, placing them in proper order of importance and sequence, when the patient's symptoms are elicited and interpreted.

The intern's time schedule should not be so completely occupied in the hospital that no time is left for reference reading. Textbook and standard journal literature should be very frequently and freely consulted while case problems are at hand.

Appreciation of the reaches of hospital activities and their significance in relation to educational facilities during internships and staff appointment periods, may be increased by referring to certain numerical evidence. The Commission on Medical Education[5] has reported upon 6,719 hospitals of from ten to over three hundred beds, with a total bed capacity of 955,869 (as of March 28, 1931), and with a patient population of 283,019,540. In the same year (1931), 6,457 students were admitted to class A schools, and from this number approximately 23 per cent, or 1,483, were deducted for failures, deaths, etc. This leaves 4,974 as an available total of those who might remain in hospitals after graduation, or less than one student per hospital. Of course, this is not the actual status, because not all students seek or are compelled to serve an internship; and many hospitals have interns for more than one year. A considerable number of the small hospitals cannot qualify for class A college internships.

It is tentatively estimated by Rypins[11] that, in the future, 33⅓ per cent fewer students will be admitted to medical schools. This will reduce the total, as given above, to 3,316.

In 1932, the total number of Federal, state, and all other hospitals[8] was given as 6,613, and the bed capacity as 974,115. Apportioning this number to the estimated number of graduates, the proportion becomes one intern for 293 beds, or an inadequate supply of hospital doctors. In the period 1928 to 1931, hospital bed capacity increased 81,181; and from 1929 to 1931, the total patient days increased 17,759,950. In this same period, 1929-31, nervous and mental patient days increased 11,581,720.

In 1931, the total hospital bed capacity was 451,245 for nervous and mental diseases, or 46.3 per cent of the total 974,115 beds for all types of diseases. Here is a field with a dire need for more doctors.

Table 15[6] of the Commission on Medical Education (1931) lists 2,346 physicians serving as superintendents, 7,054 as interns, 4,580 as resident physicians, and 102,383 as staff members, making a grand total of 116,363.

Table 16 of this same Commission gives the approximate average annual expenditures for medical care as totaling $3,225,000,000.00.

The foregoing statistical data set forth impressively the significance of the hospital in medical education.

The efficiency of the undergraduate school and its affiliated hospitals should reach comparable standards. Hospitals giving

undergraduate student instruction, should be prepared to take full responsibility of continuation teaching duties at the level of the standards of the Council on Medical Education, and of Hospitals, of the American Medical Association. This responsibility is not so easily fulfilled. Clerical help in hospitals is not likely to show much enthusiasm over requirements demanding some of their time and the disturbing of their files. The teaching staff members, especially those who receive no remuneration, are not without good excuse if they are sometimes late or absent from their class or section. There can be no good reason advanced as to why all clinical teachers should not be paid. Efficiency of instruction would follow, if even a minimum hourly remuneration were provided.

Summary

1. Medical education is defined and divided into three related parts: the pre-medical school, the undergraduate school, and the hospital.

2. A foundation of broad culture serves best for medical studies and post graduate attainments. Pre-medical studies, as such, should therefore not be encouraged, for they are not as valuable to a medical career as the subjects usually included in the A.B. course.

3. Students who are equipped to enter class A medical schools now come from a group of 1,000,000 possessing a college or university training. In 1932, the applicants for entrance to 78 schools of the United States and Canada numbered 12,280. Of this number, 4,923 were refused; and by the end of the first year, 14 per cent of entrants failed to reach the required standords.

4. Prevention of many student failures can be accomplished by better care in personal selection, better medical pedagogical methods, and an arrangement by which the first year will complete the arts or science studies, without obligation to carry on in medicine. It should be considered a pathfinder's year.

5. Metropolitan centers are supplying the largest number of medical students. Wayne University College of Medicine had 87 per cent from Detroit and environs. New York City supplied nearly 21.5 per cent of all the applicants for medicine in all states.

6. The character of the student's decision to study medicine may determine his success. The average of 15 per cent failures in all schools should be reduced by preventive means. Of Wayne University Medical College students, 9.1 per cent could state no reasons why they selected medicine, nor how long they took to make their decisions.

7. Very many of the curricular details and a number of major features of medical education should be eliminated or changed, so as to enable students to comprehend to the point of mastery more of the fundamentals of medicine. Correlation of the first year's subjects with the clinical work is greatly needed to economize both the student's and the instructor's time. Quality of work should have preference over quantity effort.

8. Of students at Wayne University Medical College 33.4 per cent had no system of association to aid in memory effort; 43.9 per cent trained the memory almost entirely by repetition; and 25.1 per cent had no plan for reading assigned texts. Inquiry reveals the above findings are duplicated in many other schools.

9. Of 314 students 58.2 per cent stated they had never had any specific instructions on "how to study."

10. A general survey of the teaching program in didactic, laboratory, and clinical work, as carried on in each department, has been made by the student council in some of our best medical schools through successive years. These reports have been graciously received and considered by the college executive councils. This practice tends to improve relations between faculty and student groups.

11. A pertinent group of suggestions are reported from the students of Wayne University College of Medicine. A coaching system of instruction was preferred by 74.5 per cent of the 314 answering a questionnaire.

12. The hospital is the place where the student integrates and organizes his five years' work, by application according to the requirements of the art and science he has learned, and at the level of efficiency required by his instructors.

13. The intern's duties in many hospitals should be so arranged as to provide more reference reading, closer study of patient problems and better case records.

14. Statistically and actually, the pro-rata of interns to patients in the United States hospitals is one intern for 293 beds. Hospital bed capacity is increasing much faster than are medical graduates. The total hospital bed capacity for nervous and mental patients is 451,245. There is a dire need in this type of hospital, as well as in tuberculosis hospitals, for more physicians than can be graduated in several years.

15. The efficiency of undergraduate medical schools and teaching hospitals should reach comparable standards.

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HEMATURIA*

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The effects of the neglect of hematuria are devastating. This can be demonstrated by the case records of any urologist and by reference to the many statistical studies available. The problem is intimately related to that of cancer control, since nearly 50 per cent of people so afflicted harbor a neoplasm somewhere in the genito-urinary tract. This applies with especial emphasis after the age of fifty and particularly in the male.

Offhand one would say that surely all physicians in the year 1934 understand the significance and gravity of hematuria. Perhaps so. Experience, however, fails to confirm this idea. There is invariably a period of lag between the discovery of facts and ideas and their common utilization. The significance of hematuria is accepted by the profession theoretically but not practically. What are the facts? Kretschmer[4] in a large series of cases found that the average length of time between the first attack of hematuria and the urological study was two and one-third years and the bladder carcinoma registry[3] reports fifty per cent of carcinoma of the bladder undiagnosed at the end of one year.

A patient was recently seen whose periods of hematuria dated back twelve years. At first the free interval was two years and in the last five years about one year. For two or three months it had been constantly present and accompanied now by frequency, nocturia and dysuria. During each attack he went to his physician for "hemostatic" medicine. He had multiple papillomas of the bladder which had undergone malignant degeneration. On rectal examination a dense subtrigonal infiltration was noted and the case was obviously inoperable. He lived about five months. Such cases are a travesty on the practice of medicine, of course, and an extreme instance of neglect; nevertheless, the time element is of great importance. A period of from six months to a year all too frequently means the difference between failure and cure. The death cited must be classed as preventable. The facts are that hematuria, unless very profuse and persistent or accompanied by severe bladder symptoms, is commonly neglected even today.

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In the majority of cases, medicine has been given to stop the bleeding, although, as far as I know, there is no drug that will stop the hemorrhage. The drug most frequently used is methenamine, but paradoxically it is far more likely to cause hematuria than to cure it. Of course, the bleeding often does stop following medication but it also stops without it. It is usually intermittent and the reasoning here is on a par with many other fallacious therapeutic deductions.

Chute found in a series of 200 cases that 75 per cent of bladder hematurias were due to tumors either malignant or potentially so, and in his whole series 44 per cent had malignancies somewhere. Even if the bleeding is due to stone, infection, or tuberculosis, while procrastination can be tolerated here with less serious results, threat to the integrity of the kidney or bladder and even loss of life may be involved. It is clearly the physician's duty, however, to insist on a complete urological study at the first appearance of blood in the urine instead of waiting for a recurrence.

There is a current notion about hematuria that is in urgent need of correction, namely, that the bleeding should stop or be stopped and then a diagnosis established. The urologist prefers to see the patient when he is bleeding. In the absence of fever or severe bladder symptoms, cystoscopy is carried out at once. The source of the hematuria is established immediately and the detective work is well on its way. If, for instance, a bloody jet of urine is seen coming from one ureteral orifice our diagnostic efforts are centered on this particular kidney. After the bleeding has ceased the problem is much more difficult.

Causes of Hematuria

Within the past ten years five large statistical studies of hematuria have been made, namely, those of MacKenzie,[7] Kretschmer, Lower,[6] VanDuzen,[9] and Debenham.[1] The number of cases tabulated varied from about 500 to 900. The causes are generally grouped under three headings: (1) diseases of the genito-urinary tract, (2) systemic diseases, and (3) diseases of adjacent organs involving the genito-urinary tract. The first group is by far the most important and comprises the great majority of the cases. The second and third groups include a very small minority and are rarely seen but must be remembered.

During the first two decades the cases are quite infrequent. Under forty, infections, including tuberculosis and stone, are the commonest causes in both sexes. After forty in the male and after fifty in the female, neoplasm becomes the commonest cause. Beyond fifty, prostatic enlargements, both benign and carcinomatous, are common causes in the male.

The male sex is afflicted more often than the female in the ratio of more than two to one. In the combined series of Kretschmer and Debenham there were 1,110 males to 473 females. The difference is largely due to the greater number of bladder tumors in the male and also to the many cases of hematuria incidental to prostatic hypertrophy. According to Debenham, if hematuria is the presenting symptom in the male there is almost a 50 per cent chance that it is due to a neoplasm, and if the only symptom, the chances are two to one.

Renal and Ureteral Hematuria

The chief causes are infection, stone, tuberculosis, tumor, and trauma. Microscopic hematuria is common in the infections and in nephritis. The combined figures of MacKenzie, Kretschmer, and Walther give 40 per cent for the upper urinary tract and 60 per cent for the lower urinary tract. According to Herman,[2] pyelitis, stone, and tuberculosis account for two-thirds of all the cases. The incidence of hematuria in these diseases is relatively low in relation to the total number of cases but they are common conditions as compared to tumor and trauma, which show an incidence of 80 per cent to 90 per cent of hematuria. The following tables give some idea of the relative frequency of the different causes of renal hematuria.

Kretschmer (843)		MacKenzie (821)	
Tuberculosis	80	Infection	132
Infection	75	Tuberculosis	88
Stone	71	Stone	64
Tumor	37	Nephritis	23
Hydronephrosis	12	Tumor	12
Polycystic kidney	7	Trauma	11
Scattered	19	Polycystic kidney	3
		Scattered	11

The figures of Herman giving the relation of the occurrence of hematuria to the primary cause are interesting and are partially quoted:

Acute hemorrhagic nephritis	100%
Trauma	90%
Papilloma	69%
Renal calculus (children)	57%
Carcinoma of kidney	56%
Ureteral calculus (microscopic)	49%
Hypernephroma	44%
Renal calculus (adults)	40%
Polycystic disease	40%
Tuberculosis	32%
Pyelitis (½ microscopic)	25%
Hydronephrosis	3%

In both series the predominant cause of ureteral hematuria was stone, although it was occasionally caused by stricture or tumor.

Vesical Hematuria

Carcinoma and papilloma outnumber all other causes, followed by stone, cystitis, trauma, elusive ulcer, and diverticulum. Hematuria due to prostatic hypertrophy might well be included here but is usually tabulated separately. The matter of bladder tumors will be discussed later but the following table testifies to their importance.

Kretschmer (843)

Carcinoma	163
Papilloma	72
Stone	31
Tuberculosis	14
Cystitis	6
Elusive ulcer	5
Diverticulum	4
Scattered	12

Prostatic and Ureteral Hematuria

Prostatic hematuria was due to hypertrophy or carcinoma in 175 out of 236 cases in the combined series of Kretschmer and MacKenzie, being by far the outstanding cause. The remainder of the cases were due to acute and chronic inflammatory conditions and stone chiefly. Urethral hematuria is quite infrequent and is caused by acute and chronic inflammatory conditions, trauma, stricture, caruncle, and foreign bodies.

Concomitant Lesions

Many cases of the simultaneous occurrence of stone and tuberculosis and stone and carcinoma in the same kidney have been reported. Carcinoma of the bladder is fairly commonly seen along with prostatic hypertrophy and this may cause some confusion and delay in the diagnosis. A case was recently seen of carcinoma and tuberculosis in the same kidney. This combination is extremely rare. Rupel[8] recently reported a case and reviewed the literature, collecting only six other cases.

Essential Hematuria

A small number of cases remain unexplained after complete investigation. These are usually called cases of essential hematuria. This designation is objectionable and probably unexplained hematuria would be better. Some use the term renal epistaxis. There is undoubtedly always a cause, though not a grossly demonstrable one. Such factors as non-opaque calculi, lesions of the renal papillæ, nephritis, and stricture of the ureter (Hunner) are probably operative. In Debenham's cases, 8 per cent later passed stones and 67 per cent had no further hematuria. Slight recurrence of the bleeding was reported in 16 per cent, but they were clinically well and 8 per cent had died of other diseases. Bumpus traced 155 cases five to twenty years and only six reported the future occurrence of renal disease. The prognosis, then, is apparently excellent. No therapy is necessary beyond the occasional treatment of the renal pelvis with one to two per cent silver nitrate. Rarely is the bleeding so severe as to require exploration and nephrectomy.

Lesions in Adjacent Organs

Appendix. Hematuria may occur by contiguity, lymphatic extension, or due to an acute glomerulonephritis. Much has been written on this topic and probably its importance has been exaggerated. Acute appendicitis is rarely mistakenly diagnosed as a renal or ureteral lesion, but perhaps one-third of the patients with painful ureteral and renal diseases, especially stone, have had a needless appendectomy. Today with the common use of intravenous urography this situation should be corrected.

Pelvic organs and bowel. Acute pelvic infections, diverticulitis, and malignancies of the cervix and sigmoid may involve the bladder and give rise to hematuria. These involvements are extremely infrequent.

Systemic Diseases

Hematuria due to systemic disease is quite uncommon but should be kept in mind in order to avoid useless urological investigations. Locke and Minot[9] have written an excellent article on this subject. Among the diseases they list are purpura hemorrhagica, symptomatic purpura, hemophilia, polycythemia vera, scurvy, infectious diseases, and conditions arising from toxic agents. The latter include bacterial toxins,

bichloride of mercury, turpentine, and cantharides. Among the drugs are mentioned methenamine, phosphorus, quinine, and the coal tar products. Methenamine is the most important, and although rarely causing hematuria can do so after quite small doses. A woman of twenty-four was recently seen who had been taking a commercial preparation for two months whose main ingredient is methenamine. During this entire period she had had hematuria and intense vesical distress amounting almost to incontinence. The condition cleared up immediately after stopping the medication. The hematuria is supposed to be usually vesical.

Investigation of Hematuria

(1) *History.* As always, this is of considerable importance, particularly in relation to the associated symptoms of lumbar pain, renal colic, vesical frequency and distress, and slow small stream. Before the advent of the modern diagnostic methods, there were elaborate tables for diagnosis on the basis of symptomatology but today this comes strictly under the head of amusement. Still the history may give the clue to a hematuria due to systemic disease. The appearance of blood at the meatus suggests a urethral origin and terminal hematuria a vesical origin. If the blood is evenly mixed in the urine either a renal or vesical lesion may be present.

(2) *Examination of the Urine.* The presence or absence of clots is noted. If they are wormlike, moulding by the ureter is probable. Blood in the urine, of course, accounts for albuminuria, whereas pyuria does not. The sediment should be examined carefully microscopically for an associated pyuria and also stained for bacterial examination. The two or three glass test is often helpful.

(3) *Intravenous Urography.* This has been of tremendous assistance since much information may be gained with no distress to the patient. A start may be made, at least, in many cases when the patient or his physician objects to cystoscopy. It is especially helpful in stone cases and acute infections where cystoscopy may be undesirable. Sufficient detail is not always obtained for the exact diagnosis of early tuberculosis and tumor but usually enough is seen to ascertain which kidney needs further checking with retrograde pyelography. In a series of several hundred cases we have never had a serious reaction and the percentage of acceptable films has been greatly increased by planning a longer period of dehydration. We stop fluids at bedtime and do not allow any food in the morning and carry out the procedure at eight or nine A. M. A totally unsatisfactory picture is a very infrequent occurrence but, of course, considerable experience has been gained in checking them with retrograde pyelograms on the same patient. In the case of trauma, where cystoscopy is always undesirable, it is a very valuable help and I will show two films illustrating this.

(4) *Cystoscopy and Pyelography.* Intravenous urography has not replaced ureteral catheterization and retrograde pyelography. The latter is still of inestimable value in checking dubious excretion pyelograms and must be frequently resorted to. Much of the curse of the so-called pyelogram reaction has been obviated by the use of catheters small enough to permit excess solution to run down the ureter to the bladder and by a substitution of newer media for the old standard sodium iodide. The drugs developed for intravenous urography are much less irritating to the renal pelvis and give excellent pyelograms. Cystoscopy is indispensable for the detection of lesions of the bladder and prostate.

Carcinoma of the Bladder

This disease is the curse of the patient with hematuria, representing certainly one half of the cases beyond fifty. The American Urological Association has authorized and supported a registry of these cases in the past few years and a comprehensive report was published in the *Journal of Urology* for April, 1934. As one would expect, there was a preponderance of males in the proportion of 3:1 in the 902 cases tabulated. Hematuria occurred in 826 cases. It was intermittent in 704 and constant in 122. That the majority have intermittent bleeding is perhaps unfortunate and I suspect that the constant bleeders were diagnosed earlier, although no figures are given on this phase of the situation. Hematuria was the initial symptom in about 70% of the cases that had bleeding, testifying to its extreme importance in the early diagnosis of this disease.

The interval between the initial hematuria and the establishment of the diagnosis is of

extraordinary interest and was as follows:

0 to 1 month	69	1 to 2 years	145
5 weeks to 3 months	75	3 to 4 years	47
3½ months to 5 months	37	5 to 6 years	18
5½ months to 8 months	65	7 plus years	26
8½ months to 11 months	26		

It will be seen that over 46 per cent remained undiagnosed at the end of one year in spite of their hematuria. The percentage of cases diagnosed at various intervals after the first appearance of any of the symptoms, including hematuria, were as follows:

End of 1 month	10.8%
End of 5½ months	32.13%
End of one year	51.7%

The fact that at the end of one year 48.3 per cent of the cases are still undiagnosed speaks for itself. The objective of all crusades against cancer has been early diagnosis but it has not been achieved with respect to cancer of the bladder.

That early diagnosis is fundamental to good results is shown by the figures on the number of cases alive at the end of five years classified as to size. 51.3 per cent of the small tumor cases were alive after five years; 40.3 per cent of the medium; and 24.5 per cent of the large. Plainly the larger the tumor is at the time of diagnosis, the poorer the prognosis. Apropos of this, Hugh Young[10] quotes Casper to the effect that the latter cystoscoped 142 cases of bladder tumor immediately after the first hematuria and that all but three were small tumors. The bladder cancer registry group showed that 45 per cent were classified as large (over 5 cm. in diameter) at the first observation, the complete figures being as follows:

Small (0 to 1.9 cm.)	117	12.9%
Medium (2 to 4.9 cm.)	320	35.5%
Large (5.0 plus)	409	45.3%
Not stated	56	6.2%

The prognosis is also influenced by the grade of the malignancy but the influence of size is, indeed, apparent.

The figures quoted show clearly that there is need for improvement in the early diagnosis of bladder tumors, which in turn means more serious consideration of and a more aggressive attitude toward the patient with hematuria. Immediate investigation at the first appearance of bloody urine will yield large dividends in correcting the present deplorable results of the treatment of cancer of the bladder.

Conclusions

(1) All cases of hematuria should be investigated at once. This is especially true after the age of fifty, since more than 50 per cent of the patients will be found to have a neoplasm.

(2) The cases should be studied preferably during the period of bleeding.

(3) If the coöperation of all members of the profession could be obtained a startling improvement in the treatment of genitourinary cancer would be immediately evident and numerous needless tragedies would be prevented.

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PUERPERAL SEPSIS*

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With your indulgence I would like to present two cases of puerperal sepsis for your consideration. One patient recovered, the other died.

The first was a private case: Mrs. J. C., aged thirty-two, para vi, gravida viii, entered the hospital on December 15, complaining of vaginal bleeding; also pain and swelling of the entire left lower limb. She admitted having used a slippery elm stick about three and a half weeks previously to terminate an eight weeks pregnancy. On December 11 she passed a fetus and some placental tissue. The next day she was curetted in her home. Within 24 hours she became quite feverish and vomited. Within 48 hours she began to have acute pains in the left foot and leg. Within 72 hours she was admitted to the hospital.

The past history was negative, with the exception of one previous uncomplicated abortion but no history of illegal induction could be obtained.

The examination revealed a well nourished Italian woman of stated age, acutely ill, lying restlessly in bed complaining of severe pain in the left leg. She was somewhat stuporous. The skin was hot, moist, pallid and herpes covered the entire upper lip. While the breathing was shallow the lungs were clear. The heart was not enlarged and there were no murmurs. The abdomen was flaccid; no viscera nor masses were palpated. There was neither tenderness nor rigidity. The left leg was slightly swollen and very tender from the knee down.

The pelvis was examined through the rectum. The cervix was slightly boggy and pointed forwards. There was marked perimetrial tenderness. No masses were present in either adnexal area. The culdesac was empty.

The blood count showed 60 per cent hemoglobin; 3,260,000 R.B.C., with 8,900 white blood count. There were 78 per cent polymorphonuclears and 22 per cent lymphocytes. The urine was essentially negative except for numerous W. B. C.

A diagnosis was made of post-abortive endometritis, metritis, and perimetritis; also phlebitis of the left leg.

Supportive treatment was started.

The blood culture proved positive for hemolytic streptococci.

Her temperature reached 104.4 on her second hospital day.

Her improvement was gradual and steady. By the eleventh hospital day all abdominal distention was gone. The phlebitis localized and drained. The temperature curve flattened out to normal and the patient was discharged on the forty-fifth day.

The second was a staff case, not on my service: Miss N. M., aged thirty-four, who was admitted on March 15, complaining of flowing, fever, weakness and cough. She stated that having found herself two months pregnant she sought an abortion. This was said to have been done by a nurse, who injected water into the uterus on March 9. Two days later she passed what she thought was a fetus. This was followed by profuse, intermittent bleeding. On March 15, six days from the induction, she called a physician, who sent her into the hospital.

Her past history is irrelevant.

Examination revealed a white, anemic female with hot, rather dry skin. She was bleeding moderately. Her temperature on admission was 99; pulse 120; and respirations 20. Within 2 hours, however, the temperature had reached 104. The abdomen was not distended and not tender. The fundus was easily palpated midway between the umbilicus and the symphysis. The lochia had a saprophytic odor. Pelvic examination was not done on admission.

A diagnosis of septic abortion, incomplete, was made.

Supportive treatment was instituted preparatory to a D. and C., which was done on the 16th. A blood transfusion was done on the 21st. Her urinalysis was negative.

Her admission blood count was as follows: 42 per cent Hgb. 2,340,000 R.B.C. 10,600 W.B.C. 71 per cent polymorphonuclears and 26 per cent lymphocytes.

She expired on March 21, 1934.

The method of treating these cases will be referred to later.

In presenting these cases and this subject we know we are offering nothing new. We feel, however, that this is a matter that can stand a great deal of ventilation. In combating this condition science has traveled all too short a distance on the road. As late as the middle of the last century there was a mortality rate of 50 per cent prevalent in epidemics of puerperal sepsis. And in lying-in institutions, an average mortality rate of 15 per cent solely from this cause was not uncommon. Then came Holmes, Semmelweiss and Lord Lister. After applying the teachings of Lister, the mortality rate was gradually lowered. During the last decade of the last century it had reached the figure of three per thousand. During the first decade of this century it was two per thousand. By 1910 there was a slight improvement downwards to one and one-half per thousand. Reluctant though we might be to admit the present facts, nevertheless, there has been no further progress made. We stand where we did in 1910. To our credit we can at least say the occurrence of epidemics of this grave condition is now comparatively rare.

In 1927 there was a virulent outbreak in Sloane's Hospital. In 1933 a small epidemic was experienced in a hospital in Saint Paul. Thomas of Glasgow in 1933 under-

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took a study of eight hundred cases of puerperal sepsis from the sepsis wards of the Belvidere Hospital. An accumulating group of facts from these and other outbreaks reveals that under the following conditions fatality rates were slightly higher:

1. In primiparæ;
2. With previous puerperal sepsis;
3. Cases attended by doctors (as compared with licensed European midwives);
4. Instrumention; and
5. Precipitate labor.

Under abnormalities of the third stage, a large majority of fatalities followed normally expelled complete placentæ.

With unusually long labor, trauma or weakened resistance from hemorrhage the incidence of recurrence was greater.

You are all familiar with the lines of inquiry usually pursued in studying this condition up until recently, namely:

1. The cultivations of the organisms from the cervix;
2. The cultivations of organisms from the blood;
3. The examination of material from secondary suppurative processes during life or post mortem; and
4. Tests for cutaneous sensitiveness.

In recent epidemics, tests from hands and throats of all attendants were made and, on all who were found positive for hemolytic streptococci, weekly tests were made while the individuals were routinely treated with nose and throat antiseptics.

At the present time dissatisfaction with our present methods of inquiry is apparent. There is a disposition to go back to the bacteriological laboratory and begin more than ever with the offending organism itself.

By doing so we may at least improve our point of view regarding the offending organism. The streptococcus is almost omnipresent. It is almost constantly present in milk. Streptococcus lactis with its allies is the organism held responsible for naturally fermented milk. Two pathological outbreaks of food poisoning were assumed by Linden to be due to a streptococcus. The feces of practically all animals and fowls—even the bees—are known to be loaded with streptococci, frequently hemolytic in type. Streptococci in human feces frequently outnumber colon bacilli. If certain varieties of streptococci are in excess in swimming pools they may be taken as indicating recent sewage pollution. On household and restaurant knives, forks, spoons, glasses, butter plates, et cetera, the hemolytic streptococcus is usually present. Usually the streptococci found in the upper air passages and intestines of healthy humans give no evidence of disease. Yet it has been demonstrated that, given the opportunity, they can assume virulent properties. This was demonstrated during the world war measles epidemic. The secondary streptococcic infections were mild at first but later caused severe primary pneumonias with a high mortality rate. Davis considers the tonsilar crypts in humans to be the natural habitat of streptococcus hemolyticus, while on the surface of the same tonsil a nonhemolytic type is usually recovered.

Rosenow believes he can induce mutations of pneumococci into streptococci and vice versa. Before 1927 mutations were considered a bogey. In that year Williams took what was considered to be a single streptococcus and obtained definite evidence that certain lasting changes actually occurred. In 1930, Todd presented evidence to prove that virulent hemolytic streptococci were definitely changed into avirulent nonhemolytic cells by prolonging aërobic subcultivations; and that he can wilfully change them back again, all depending upon the conditions of cultivation.

We know that the pathological effects of streptococcic infections may be local, general, toxic, septic or pyemic, depending on the type of organism or organisms, site of infections and susceptibility of the host. All types of effects are seen. The virulent hemolytic streptococcus can produce a fatal general infection causing death within a week. Less virulent streptococci may form a local abscess or edema first. A still less virulent type is capable of producing all grades of more or less localized inflammatory reaction in different parts of the body.

Regarding treatment, nothing stands out with so much importance as prophylaxis. A mass of literature is found concerning the treatment of this condition, offering a veritable maze of ideas. New therapeutics are now lauded; now discarded. And, through all this, certain fundamental ideas stand out well above the others. These are well incorporated in the following thera-

peutic methods cited by the late Doctor Polak:

1. Firm uterine contractions;
2. Supportive measures as indicated;
3. Fresh air and sunlight;
4. Early and repeated blood transfusions;
5. Stimulations of leukocytosis with foreign proteins;
6. Incision and drainage of localized collections; and
7. Intelligent aid in the development of nature's defensive mechanisms.

We might point out here in passing that Case No. 1 had a focus of free suppuration and she recovered. Fochier recommended the production of an abscess formation by the injection of turpentine in the thigh, reporting 120 cases in his series.

To go beyond these fundamentals, one finds a wide variation in the treatment of this condition, even in first class institutions. As a matter of interest I am listing below the accepted treatments given in six well known hospitals in the British Isles where the mortality rate is possibly lower than found elsewhere:

1. The Rotunda Hospital: Prophylactic posture; fomentations to the abdomen; antianemic measures; serum quinine treatment; collosal iodine; polyvalent anti-streptococcic serum; quinine and femergin; Lukers' treatment; blood transfusions; vaccines; hysterectomy in suitable cases.

2. Coombe Hospital: Prophylaxis consisting of the injection of 2 per cent mercurochrome into the vagina with a syringe every twelve hours in a delayed labor and before any vaginal examination; the use of cotton wool instead of cotton; anti-streptococcic serum in any case of operative obstetrics except low forceps. Treatment consisting of: Karsulphan 3 gms. intramuscularly at 0, 6, 24, 48, and 96 hours (except in cases of toxemia); Luker's treatment, consisting of the daily intravenous injection of 20 c.c. of collosal iodine for five days; the use of scarlatinal antitoxin. No vaccines are employed.

3. National Maternity Hospital: The infected uterus is never entered except for control of hemorrhage or if it is certain that some placenta is retained. In general sepsis, treatments are mostly on general lines: Saline per rectum; whisky by mouth; blood transfusions; antistreptococcic serum in large doses—50 c.c.; mirion or omnadin. Hysterectomy has not been done.

4. Professor Lowry, Belfast: Routine autogenous vaccine, if the organism is found, administered early to start with—one half million in cases of streptococcic infections; keep on blood transfusions; has done no hysterectomy nor ligation of pelvic veins.

5. Professor Murray, Newcastle on Tyne: Feels the whole treatment of puerperal sepsis is in a most unsatisfactory state. He does not employ vaccines in acute cases and is doubtful of their value in chronic ones; he has faith in polyvalent antistreptococcic serum given in intravenous saline; and regards hysterectomy as wholly unjustifiable.

6. Queen Charlotte's of London has just opened up their isolation department. They give routinely intrauterine glycerine after Hobbs' technic. They also employ Metarsenobillion; Radiostoleum and S. U. P. occasionally. Vaccines and sera are not much thought of. Various intravenous solutions have been tried with invariable fatal results.

To be sure, it is a far cry from the time of Semmelweiss till now. Wonderful advances have been made but now advancement has apparently stopped. His contemporaries were reluctant to embrace the suggestions then advanced. It would be easy for us to commit the same error.

Recently, in a study of puerperal sepsis, intrauterine cultures were made in 171 consecutive cases. As a matter of interest, note in the following tabulations the number of organisms found. They are given with the percentage of their incidence:

26.8 per cent anaërobic diphtheroids; 23.3 per cent anaërobic staphylococci; 6.4 per cent anaërobic Gram-negative bacilli; 3.5 per cent anaërobic gas bacilli; 13.4 per cent aërobic nonhemolytic streptococci; 14.0 per cent aërobic green streptococci; 8.7 per cent aërobic diphtheroids; 8.7 per cent B. coli; 4.6 per cent staphylococcus albus; .5 per cent staphylococcus aureus; .5 per cent B. proteus; 1.1 per cent monilia; 8.1 per cent showed no growth.

Lest we lull ourselves into a false sense of security. Suppose we review the various bacteria found as positive and probable causes of puerperal infection:

Streptococci, hemolytic and nonhemolytic, pyogenes viridans, etc.; diplostreptococ-

cus puerperalis; staphylococcus aureus and albus, some hemolytic; bacillus coli; diplococcus lanceolatus pneumoniæ; gonococcus of Neisser; bacillus pneumoniæ of Friedlander; bacillus pyocyaneus; bacillus proteus; bacillus aërogenes capsulatus (Welchii); bacillus fusiformis and spirilla (often found in hospital gangrene); bacillus typhosus; bacillus tetani; bacillus anthracis; bacillus diphtheriæ; bacillus influenzæ.

To be confronted with such a formidable list reminds me of the old colored parson who preached with fervor and at great length on the text, "In Stato Quo." Following the service, one of the deacons, in congratulating him on his fine sermon, asked the pastor what was meant by the text.

"In stato quo," said the parson, thinking quickly, "Means dat we is in a hell of a fix."

And, gentlemen, that very nearly describes our position.

De Lee gives the following predisposing causes of puerperal fever:

1. Pregnancy itself. 2. Shock of labor. 3. All conditions reducing vitality. 4. Lack of thyroid or action of other blood forming organs. 5. Prolonged labor. 6. Operative interference. 7. Retention of placenta, membrane or clots. The massiveness of the etiology is appalling.

Then we might first of all conclude that the most important factor in our armamentarium is prophylaxis. Second, the treatment must largely be individual. Third, the thing most generally agreed upon in cases of actual septicemia is to increase the fighting power of the leukocytes and, fourth, the production of a leukocytosis. Fifth, because of more recent bacterial findings regarding mutation, anaërobiosis and auto infections, a portion of the responsibility might well be lifted from the shoulders of the attending physician in these cases of infection. And, sixth, since these organisms have been demonstrated as lying dormant in human tissue 18 years after known introduction, we must strive more than ever to safeguard the initial resistance of the patient.

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THE TREATMENT OF CRANIO-CEREBRAL INJURIES*

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Fractures of the skull are unique among the fractures of other bones of the body in that the fracture is relatively unimportant. The injury to the brain should receive primary consideration. This trite statement has been made very often and under many disguises, but cannot be over-emphasized. It is only of academic interest to classify or describe the various fractures of the vault or base. It is impractical and of little help clinically to group symptoms in order that one may speak of the syndrome of "concussion" or "contusion." Such classifications lead the inexperienced to institute a set régime of therapy and do not emphasize the fact that each case of skull injury is an individual problem to be treated, if necessary, by a combination of methods. There should be no advocacy of one method of therapy in skull injuries. With the full realization that there can be no hard and fast division of the clinical symptoms which accompany skull injuries, it does become necessary for descriptive purposes to point out certain clinical symptoms which are encountered most commonly.

The most simple type of skull injury en-

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countered is that in which the patient has received a blow upon the head, either by a fall or by being struck by a moving object. The period of loss of consciousness, which immediately ensues, may last from a few minutes to several hours. There may or may not be a laceration of the scalp, and a linear fracture of the vault of the skull may or may not be present. In any event, the period of loss of consciousness is an indication of the severity of the cerebral trauma, provided that a careful neurological examination has failed to reveal a disturbance of motor function or other symptoms attributable to direct cortical damage.

In a second group of cases, in which the etiological factors may have been exactly the same, loss of consciousness may be accompanied by bleeding and a discharge of cerebrospinal fluid from the ears or nose. Conjunctival and periorbital hemorrhages may be present. Blood may not escape from the ear and yet the tympanic membrane may be bluish-red and bulging from a hemorrhage which has not perforated through the drum. It may be concluded that under such circumstances blood has found its way into the subarachnoid spaces. Contusion and laceration of the inferior surfaces of the frontal or temporal lobes, or a basilar fracture of the skull are present commonly in this group of cases. Damage to the cerebral cortex in these locations may not be accompanied by evidences of motor or sensory dysfunction as is the case in injury to the brain over the convexities of the surface. As a result of the blood in the subarachnoid spaces, the patient may be extremely restless and difficult to control. In addition, there is always a variable degree of rigidity of the neck which is indicative of meningeal irritation. One or more of the cranial nerves may be damaged in these more severe injuries. Not uncommonly the third, fourth and sixth cranial nerves which innervate the extraocular muscles and the facial and acoustic nerves may be damaged directly or become compressed by the formation of a hematoma.

In a third group of patients, depression of the fractured fragments of the skull may be present. The inner or outer table alone may be depressed, or there may be a complete solution of continuity so that both tables rest upon the underlying brain. Depressed fractures of the skull may be present with or without a laceration of the scalp. In severe crushing injuries, the scalp may be lacerated severely and the skull fracture may not only be comminuted but some of the fragments may be driven into the brain. In such instances there are tears in the dura mater and destruction of brain tissue, which may be so pulpified as to escape from the wound.

In contradistinction to those clinical symptoms just described in which coma immediately follows the injury, are those cases in which coma appears some time after the injury. There may be a short period of loss of consciousness, followed by a lucid interval with the onset of a second period of loss of consciousness. Or, the patient may have no loss of consciousness immediately after the injury and then later gradually become comatose. This group of symptoms will be recognized as those characteristic of the classical picture of hemorrhage from the middle meningeal artery. Many descriptions have been given of the combination of symptoms involving the pulse, blood pressure and respirations under such circumstances. However, the most pathognomonic sign of middle meningeal hemorrhage is *dilatation of the pupil upon the side of the hemorrhage.* It should be remembered that bleeding from the middle meningeal artery may occur on the side opposite to that of the skull injury. The importance of this index of increasing cerebral compression which is localized cannot be insisted upon too strongly. If the bleeding occurs slowly, and it is always extradural in these cases, the ensuing coma is slow in developing so that early the patient may be stuporous. Under such circumstances, careful neurological examination will reveal a weakness of the muscles of the face and arm certainly, and possibly the leg. To request a patient who is stuporous to grasp or to perform gross voluntary movements which require considerable effort is not an accurate method of determining slight differences in muscle strength. One should observe the facial muscles in emotional expressions; the differences in the size of the palpebral fissures, or the tendency of the weak upper extremity to fall away as both extremities are held outstretched. It is such slight but definite evidences of motor weakness which corrobor-

ate the surmise of an increasing lesion over the opposite side of the cerebral cortex.

Even though the patient loses consciousness rapidly and cannot coöperate in the examination, one may, by careful observation, detect a difference in the tone of the muscles upon the two sides of the body. The upper eyelids may be raised passively and allowed to fall. On the affected side the eyelid may cover the eyeball slowly or not at all, while on the normal side it quickly returns to its original position. Likewise, the arm may be raised over the face or chest of the patient and allowed to fall. Though the patient may not voluntarily move either extremity, the difference in muscle tone may be observed quite readily as the normal arm avoids the face in its descent. Passive flexion of the lower extremities followed by sudden release is a valuable method of eliciting a difference in muscle tone in the legs. The paretic limb falls quickly and in an abducted position; whereas, the normal limb gradually slides into its original position.

Hemorrhage beneath the dura in an amount sufficient to produce symptoms may occur relatively soon after a skull injury, or many months or years may elapse before the gradually developing hematoma produces symptoms. Subdural hematomas are not uncommon and yet, because of the gradual onset of symptoms, they are not easily diagnosed. The same methods for the detection of slight differences in muscle tone on the two sides of the body may be utilized in these cases to great advantage. Many cases of chronic subdural hematomas are upon record which have produced symptoms years after a supposedly trifling skull injury. Many times these symptoms have been attributed wrongly to intracranial tumors or an organic psychosis.

Finally, several complications may follow skull injuries which add to the gravity of the patient's prognosis. Every patient who has a discharge of cerebrospinal fluid from the ears or nose is potentially a patient in whom a suppurative meningitis may develop. An apparently simple linear fracture of the skull in which a laceration of the scalp has occurred may be followed by the development of an intracranial abscess accompanied by neurological symptoms dependent in their character upon the location and the chronicity of the infectious process. There are many cases upon record in which air has been found within the cranial cavity, or within the cerebrum, upon x-ray examination of the skull. These cases of pneumocephalus follow fractures through the accessory nasal sinuses which extend into the cranial cavity. They are often associated with a discharge of cerebrospinal fluid from the nose.

It should not be assumed that the changes in the pulse, blood pressure, and respirations which accompany skull injuries are not of importance. However, they fluctuate tremendously in individuals who may have similar types of injuries, and, what is more important, they may vary markedly within short periods of time in the same individual. Therefore, while a careful, frequent record of the pulse, blood pressure, and respirations should be kept, their greatest value lies in the evidence they provide of the effects of therapy rather than of the aid they give in establishing a diagnosis. It is not uncommon to be misled by a slow pulse in an individual who normally has a bradycardia.

It is to be emphasized again that each patient cannot be filed in any one category of symptoms. A middle meningeal hemorrhage or subdural hematoma may develop in an individual who received an apparently minor injury to the skull. On the contrary, a patient with a compound, comminuted skull fracture with depression of fragments may never suffer loss of consciousness. Likewise, a patient with an extensive laceration of the scalp received from a blow of comparatively small force may be in shock from a loss of blood. The important point then is to examine each patient carefully for any evidence of cerebral damage; to be alert to the possible onset of symptoms which point to a latent lesion; to evaluate properly those symptoms which are present and, finally, to recognize the principles underlying their treatment and the methods which can be employed effectively to aid in recovery.

Before the treatment of skull injuries can be individualized it is necessary to have a knowledge and understanding of the mechanism of the cerebrospinal fluid system.

The cerebrospinal fluid, which is produced largely by the choroid plexuses, is poured directly into the lateral cerebral ventricles, which are lined by ependymal cells. That portion of the fluid which is formed by the

choroid plexus in the lateral ventricles passes through the foramen of Monro into the third ventricle, and then by way of the aqueduct of Sylvius into the fourth ventricle. From there the fluid passes into the subarachnoid spaces through the two lateral foramina of Luschka and the medial foramen of Magendie. From the dilatation of the subarachnoid space in the midline between the cerebellum and the medulla (cisterna magna) the fluid flows slowly downward into the spinal subarachnoid space. However, at the same time it passes upward more rapidly about the base of the brain where other subarachnoid cisterns are present, and then more slowly over the cerebral hemispheres. This movement of the fluid is facilitated by impulses transmitted to it by the vascular system. According to the present anatomical descriptions, the subarachnoid space in which the fluid circulates is between the arachnoidea and the pia mater. Numerous delicate spider web-like trabeculæ project from the arachnoidea to the pia mater. Flat, polygonal mesothelial cells cover the inner surface of the arachnoid, the trabeculæ, the surface of the brain and all blood vessels which pass through the subarachnoid space. These mesothelial cells establish a periadventitial fluid channel about each blood vessel which penetrates the nervous system. The subdural space has but a slight relationship to the circulation of cerebrospinal fluid. However, the dura mater and arachnoidea fuse at the points where the arachnoid penetrates the dense fibrous tissue of the dura mater. These are the arachnoid villi, by which the mesothelial cells of the arachnoid come directly beneath the vascular endothelium of the large dural venous sinuses.

The cerebrospinal fluid then circulates everywhere about the central nervous system; in the ventricles and in the meshes of the subarachnoid space. These channels are lined by special fluid-retaining cells so that a true circulation is maintained. In the arachnoid villi the fluid comes into close relation with the large venous sinuses of the dura mater and it is at this point that absorption occurs. The mechanism of passage of the fluid is a process of filtration from a point of higher pressure to a point of lower pressure with later experimental evidence to show that the fluid is a dialysate in osmotic and hydrostatic equilibrium with the blood. There is a second method of absorption in which the fluid escapes slowly into the true lymphatic vessels in an indirect manner.

In the presence of trauma to the brain, edema occurs and an actual increase in brain volume follows. Circulation of the cerebrospinal fluid is interfered with, and a rise in cerebrospinal fluid and venous pressure occurs. With the skull and vertebral column as inelastic and rigid containers, the pressure of the cerebrospinal fluid and intracranial vascular pressures have a close relationship. It may be stated that the cerebrospinal fluid pressure varies with the blood pressure but follows more accurately the venous than the arterial pressure. The therapeutic problem is therefore to help re-establish the normal fluid and vascular pressures, and to reduce the increased brain volume brought about by edema.

The treatment of skull fractures may be divided into non-surgical and surgical. By far the larger number of cases fall into the former group, because there are only three indications for surgery in the treatment of skull fractures. These are (1) middle meningeal hemorrhage, (2) subdural hematoma and (3) depressed fractures.

Non-surgical Therapy

The first consideration in the treatment of a patient who has received a skull injury is to combat any shock which may be present as the result of hemorrhage, or from the severity of the trauma. Warmth is the most effective single method in these cases, unless of course bleeding from the scalp or from some other injury has been so severe that it is obvious that a transfusion is required. The recovery from shock, without hemorrhage, which follows a skull injury is usually quite prompt unless the injury is so extensive that death occurs within a short time. This statement indicates that there is a group of skull injuries in which active well-directed treatment is of no avail and death occurs soon after the injury.

When blood or cerebrospinal fluid are escaping from the ears or nose, those cavities should be left alone except for a loosely introduced piece of sterile cotton to absorb the discharge. No irrigating solutions of any kind should be introduced into the aural or nasal cavities because of the danger of infection. Examinations of these cavities

should be restricted to the absolute minimum if practiced at all. The adherence to these strict rules is an excellent prophylaxis against a complicating meningitis.

The patient should be placed in a warm bed with the head flat. The use of an ice-bag upon the top of the head is of little or no value. The use of an ice glove over a swollen, edematous cheek or eye aids materially in its reduction.

It is not necessary to rush the patient to the x-ray room for films of the skull. Though a depressed fracture is palpated, it is more important to get the patient into a warm bed than it is to subject him to the manipulations necessary to obtain skull films. Moreover, satisfactory films can be obtained by a portable apparatus which may be taken to the bedside. Even under such circumstances the patient's head should not be forced into unusual positions or roughly handled. When the patient has recovered consciousness and is on the mend, carefully taken lateral, antero-posterior and postero-anterior films may be made. The latter often disclose fractures which cannot be visualized in the lateral position.

The second step to be taken is to reduce edema, brain volume and intracranial pressure. There are two methods employed commonly to bring about these results: (1) the administration of hypertonic solutions and (2) spinal punctures.

Hypertonic Solutions

In 1919, Weed and McKibben[10] reported that cerebrospinal fluid pressure could be markedly altered by the intravenous injections of solutions of various concentrations. They showed that the intravenous injection of strongly hypertonic solutions lowered the cerebrospinal fluid pressure to such a degree that often negative readings were recorded. With hypotonic solutions (distilled water) a prolonged rise in fluid pressure occurred. Accompanying these changes in the fluid pressure, Weed and McKibben[11] found marked alterations in the volume of the brain, so that the hypertonic solutions produced a small, shrunken brain.

These findings have been confirmed many times both in the laboratory and clinically, so that clinical applications of these phenomena have been developed. Cushing and Foley[1] showed that the ingestion of hypertonic solutions reduced cerebrospinal fluid pressure and Foley and Putnam[4] administered hypertonic solutions intra-intestinally with similar results. Many neurological surgeons have observed the decrease in brain volume at the operating table after the administration of intravenous hypertonic solutions. Weed and Hughson[9] extended the original observations somewhat in addition to confirming the effects of hypertonic solutions and showed that the cerebrospinal fluid pressure became profoundly lowered, while the sagittal and brachial venous pressures remained about the same. It is, therefore, possible to reduce cerebrospinal fluid pressure without greatly affecting the systemic blood pressure. These changes in the cerebrospinal fluid, effected by hypertonic solutions, have their explanation in the alteration of the osmotic pressure of the blood. The increase in the pressure of the cerebrospinal fluid and in the brain volume may be taken to mean a passage of fluid from blood vessel to tissue. The fall of cerebrospinal fluid pressure and brain volume after the injection of hypertonic solutions points to the attraction of water from the body tissues and possibly from the body fluids.

It was natural that these physiological findings be developed for clinical use. It was found early that hypertonic saline solution was dangerous because of its effect upon the kidneys, among other organs. Fifty per cent glucose solution was substituted for intravenous injection. For adults in coma, 100 c.c. of 50 per cent solution should be given intravenously every 12 hours until the patient becomes coöperative. It may then be given as the patient's condition warrants. It should be given slowly and as long as 30 to 40 minutes should elapse for the injection of 100 c.c. For children the dosage should not be over 50 c.c. of the same solution and this may be reduced according to the age of the patient. Clinical experience indicates that the same results cannot be obtained by giving 200 c.c. of 25 per cent solution instead of 100 c.c. of 50 per cent solution.

Magnesium sulphate in a saturated solution may be used by a Murphy drip intrarectal administration. One hundred fifty c.c. every 3 to 4 hours may be given to an adult. In spite of a slow administration, the rectal mucosa soon becomes irritated and the patient begins to expel the

solution. If oral administration can be used the solution may be given once every 24 hours in a 5 or 6 ounce dose. If this is impossible, because of coma, a stomach tube should be passed and hypertonic solutions administered in that manner.

At the same time the intake of fluids should be restricted to that amount which will avoid the equally dangerous results of dehydration. The administration of fluids can and should include liquid foods so that the patient in coma is not allowed to go without food sufficient to maintain his nutrition in a resting state. If necessary these should be given by a stomach tube, and a solution of cream, eggs and sugar which contains one calorie for each cubic centimeter of fluid has been found to be very efficient. An adult may be given 600 c.c. of this mixture three times daily. This is not enough at any one feeding to be regurgitated and at the same time furnishes an adequate number of calories.

Lumbar Puncture

A lumbar spinal puncture may be a valuable aid in the treatment of skull injuries, or at the same time it may be most dangerous.

Blood in the subarachnoid spaces is a source of meningeal irritation, the promiment symptoms of which are restlessness and rigidity of the neck. Both of these symptoms vary with the amount of blood present. Extensive basilar injuries with a large amount of blood in the basilar arachnoid cisterns may produce a clinical condition which simulates experimental decerebrate rigidity.

Unfortunately, it has become a common practice to perform lumbar punctures as a matter of routine to determine the presence or absence of blood in the cerebrospinal fluid. Careful examination of the patient, particularly if there is an escape of blood and fluid from the ears, makes a lumbar puncture for diagnostic purposes unnecessary.

It is in these patients with blood in the subarachnoid spaces that lumbar puncture has its greatest usefulness. An accurate manometric reading should be made of the initial pressure. Removal of the fluid should be done under constant manometric control, so that the cerebrospinal fluid pressure may not be reduced far beyond the normal, which varies between 180 and 200 mms. of water pressure. The removal of bloody fluid from a patient who is restless and difficult to control produces striking results. This should be repeated at intervals of 8 to 12 hours or less, depending upon the patient's symptoms. It will be found that the fluid becomes less bloody, then xanthochromic and finally clear as the symptoms disappear.

Lumbar punctures are often employed repeatedly to maintain reduced cerebrospinal fluid pressure. While this may be accomplished for a short period, the pressure does not remain lowered. It must be remembered, too, that in addition to an increase of pressure there exists an increase in brain volume and it has been proven that hypertonic solutions reduce both brain bulk and cerebrospinal fluid pressure.

Finally, lumbar punctures done without manometric control and in which there is a sudden reduction of pressure at the lowest point in the spinal fluid system are dangerous. Minute hemorrhage in the brain stem and sudden collapse of the cerebellar tonsils into the foramen magnum may occur with a fatal termination. Especially are these circumstances likely to occur in children. The physiological reduction of pressure by hypertonic solutions is certainly more efficient and less dangerous than the mechanical reduction by spinal puncture.

Nursing Care and Drugs

Patients with skull injuries must be nursed carefully. Many times the patient is restless only because of a distended urinary bladder, or because of bed clothing which has been wet by an involuntary urination. There is perhaps no other one group of patients who generally receive so little careful, detailed nursing attention as the skull injuries, particularly in large charitable institutions. Good nursing, with the judicious use of restraints, will make unnecessary the commonly employed narcotic drugs.

Morphine should be absolutely contraindicated in every case of skull injury. In the first place morphine is a medullary depressant and adds only to the depression of the respiratory and vasomotor centers of the medulla. It is common to see a Cheyne-Stokes respiratory rhythm disappear when morphine has been stopped. Secondly, morphine masks the most valuable symptoms of gradually increasing intracranial compres-

sion. It is impossible to judge whether the stupor is increasing or decreasing. The contracted pupils which result mask completely the important pupillary dilatation of a localized hemorrhage. Its only advantage is that it produces quiet, which can be effected in the majority of instances by less dangerous methods. If it is believed that some medication is absolutely necessary, then drugs with less depressant effects upon the medulla should be employed. However, the use of hypertonic solutions, the removal of blood from the meningeal spaces, and good nursing accomplish this result with far more benefit to the patient, but these methods do require detailed care and attention. Recently Kennedy and Wortis[5] have recommended the administration of caffeine sodiobenzoate, in 0.5 gm. doses every four hours for the reduction of intracranial pressure and have presented good evidence in support of their views.

Every patient with a skull injury, accompanied by coma, should be kept flat in bed at all times for a minimum period of two weeks and this time should be extended in the more severe cases. It has been amply demonstrated that this is an excellent prophylaxis against the disturbing late symptoms of headache and vertigo which many of these patients develop.

Subtemporal Decompression

It should be noted that a subtemporal decompression has not been described as a method of therapy in this group of skull injuries to which by far the largest number of patients belong. No matter how carefully performed and in the hands of a surgeon experienced in handling nerve tissue, some edema will follow this operation. This adds only to that intracranial pressure which already exists. It has been proved that the mortality rate following the treatment of skull fractures in a large charity hospital has been lowered tremendously since the abandonment of decompression operations for the relief of traumatic edema.

Surgical Treatment

This naturally brings up the question of just what the indications are for surgical treatment. To repeat them they are (1) middle meningeal bleeding, (2) subdural hematoma and (3) depressed fractures.

Middle Meningeal Hemorrhage

The three most characteristic symptoms of this condition are (1) dilatation of the pupil upon the side of the *hemorrhage;* (2) gradual onset of coma with or without an early lucid interval; and (3) the presence of signs of motor weakness on that side of the body opposite to the dilated pupil. The location of the external injury to the scalp or of the skull fracture must not influence the localizing diagnoses in these cases.

Middle meningeal arteries may vary enormously in their relations between the two sides of the head. The most common type is that which has an anterior and posterior branch which arises from the main trunk as it lies in the middle fossa, near the foramen spinosum, or farther up on the dura mater covering the lateral surface of the temporal lobe. However, there may be two or more branches running anteriorly and posteriorly. The fact that the parent trunk or any of these branches may be torn should indicate definitely the character of the operation which should be performed.

A typical osteoplastic craniotomy operation should be done with the temporal bone as the center of the bone flap. Attention should be paid to all of the meticulous details of such a procedure. There should be no bleeding from the scalp during the operation if proper hemostasis is employed. With the flap elevated, the clot should be irrigated away with normal saline solution and the origin of the bleeding discovered. If it is on the surface of the dura, a fine cambric silk suture or a silver clip should be used for ligation. It may be necessary to elevate the dura from the floor of the middle fossa and compress the vessel into the foramen spinosum by bone wax in order to control the bleeding successfully. If very small oozing points still remain on the surface of the dura, small muscle stamps prove very efficient in controlling the bleeding. The bone and scalp flap should be replaced and sutured with the finest catgut or cambric silk sutures, layer by layer. No drainage material should be used if hemostasis has been effected. The bone flap should be so securely fastened that riding cannot occur. Any operative procedure which does not afford a rather extensive view of the middle cranial fossa and the convex surface of the cerebral hemisphere is likely to be accompanied by serious difficulties.

Subdural Hematomas

A rather trivial injury to the head may be followed, in certain individuals, by symptoms of cortical irritation and of increased intracranial pressure due to a subdural hematoma. These symptoms develop after a latent period which may vary from a few hours to months, or years. The hematoma, which is subdural and not extradural, is enclosed in a continuous membrane which may be slightly adherent to the dura but not to the arachnoid. On the arachnoid side this membrane is thin and is covered by a layer of mesothelium-lined spaces containing blood and fibrin.

In some cases in which the onset of symptoms is delayed for only a few days following the trauma it may be that the bleeding occurs immediately after the accident and symptoms develop only when the brain becomes edematous. In the more chronic cases, the hematoma may be very thick, olive green and mottled, and this rather characteristic color is transmitted through the dura mater. The exact source of the bleeding is not as yet known accurately. In some instances the subdural hemorrhage is acute and quite extensive so that symptoms are produced immediately. Under such circumstances an extensive dural or cortical laceration proves to be the source of the hemorrhage.

When the presence of a subdural hematoma is suspected an exploratory craniodural opening over one or both hemispheres will give the most reliable evidence of the presence of the clot. Very frequently the hematoma is bilateral. Occasionally, the spinal fluid may be slightly xanthochromic but more often it is normal in appearance. If the diagnosis is verified, an osteoplastic craniotomy with reflection of a dural flap should be done. The clot should be removed as intact as possible. It may be peeled off the underlying cortex rather easily and resembles a fresh piece of liver in its consistency. Here again hemostasis must be very painstaking. If the clot is removed carefully and completely there is little danger of its reformation. On the other hand, cerebral edema may occur in the brain which is suddenly released from a rather long continued pressure. Therefore, it may be advisable to leave a stellate shaped opening in the dura mater over the temporal lobe and remove the temporal bone from the bone flap, thus affording a decompression opening. The additional use of hypertonic solutions intravenously will aid in the treatment of the patient.

The diagnosis of this condition is often very difficult and a hematoma may be encountered when least expected. Putnam and Cushing[8] have given a comprehensive description of the chronic subdural hematomas and since the appearance of their article many other reports have appeared in the literature. Only recently, Fleming and Jones[3] have described a method of drainage for the treatment of these patients.

Depressed Fractures

Depression of one or both tables of the skull may occur without any scalp injury. It is sometimes difficult to determine the presence of a depression without carefully made x-ray films of the skull. Often upon palpation the periphery of an extensive hematoma of the scalp will give almost the exact impression of a large depression of the bone. This should always be checked by roentgenograms.

It is the simple depressed fractures which require careful and conservative judgment concerning their treatment. Certainly not every depression of the skull should be operated upon. Rather pronounced depressions of the bone may not produce the slightest neurological symptom. To operate upon each case because of the anticipation of epilepsy or other evidences of a cortical nature is to disregard the small percentage of relationship between these symptoms and extensive skull injuries which was brought out in the Great War. If obvious symptoms are present with a depressed fracture, the defect should be remedied. A small scalp flap incision should be made with the depression as the center. Persistent attempts to pry the fragments back into position should not be made. There is no reason why the fragments should not be approached by a rongeur through a burr hole opening in the adjacent normal skull and removed. Less damage to the underlying dura and brain is likely to follow the latter procedure.

Large, extensive wounds of the scalp and skull may be accompanied by comminution of the bone fragments, some of which may be driven through the dura mater into the brain along with other foreign materials. These ragged, lacerated wounds of the scalp

should be cleaned with soap and water, irrigated lightly with saline solution and the surrounding scalp should be shaved carefully. The wound should then be converted into a tripod incision and the edges debrided. These three flaps of the scalp may be retracted and the skull injury explored carefully. A tear in the dura should not be enlarged. Pieces of indriven bone, hair or clothing should be removed, with a fine forceps. A soft rubber catheter should be passed through the opening in the dura and into the wound in the brain. By irrigating gently through the catheter with sterile saline solution and by gentle suction with a glass syringe and bulb, pulped brain and very small pieces of bone will escape from the wound in the brain.

The scalp incisions should be closed carefully and in layers, particularly over the site of the original laceration. A small rubber tissue drain may be placed in one of the angles of the incision and left for 48 hours. The dangers are, of course, the development of a brain abscess and meningitis. The frequency of these conditions is much less in a wound which is converted into one which can be primarily sutured.

Treatment of Complications

Meningitis.—Repeated lumbar punctures, when and if a meningitis has complicated the clinical picture, are of great benefit. They provide a method of draining the infected subarachnoid spaces and should be repeated as often as every 6 hours if necessary. A careful cell count of each specimen removed should be made and at each puncture the pressure should be reduced to normal or slightly below. In addition, the patient should be given large amounts of fluids by mouth or subcutaneously during a 12 hour period. During the following 12 hours hypertonic solutions should be given intravenously in addition to lumbar spinal drainage. By this means one may hope to wash out the subarachnoid spaces. Often the exudate of a suppurative meningitis may produce an obstruction in the subarachnoid spaces about the cisterna magna and lumbar puncture will not drain these spaces effectively. This may be determined by a Queckenstedt test, which consists in light compression of the jugular veins with a lumbar puncture needle and manometer to record the fluid pressure. Normally, light pressure upon the jugular veins is followed by a prompt rise in the pressure, and release is followed by a prompt fall. The presence of a block in the subarachnoid spaces between the cranial cavity and the lumbar spinal sac prevents this phenomenon. It may then become necessary to perform a cisterna magna puncture to drain the infected subarachnoid spaces.

The introduction of various types of sera into the spinal canal in suppurative meningitis is of little avail. Pollock[7] has shown that any substance introduced into the lumbar canal never ascends higher than the medulla, unless an opening be made into the dura over the cerebral hemispheres. Laminectomies with the introduction of a drain into the spinal dural sac have been performed in an attempt to provide drainage in cases of suppurative meningitis. The recorded results have not been sufficiently beneficial to afford much hope in this method of treatment.

Brain Abscess.—Abscesses may develop in the tract of the brain injury and are under those circumstances commonly associated with a meningitis. On the other hand, an abscess may occur following an apparently trivial scalp and skull injury, but one which has produced a small tear in the dura mater.

As in all intracranial abscesses, the treatment and its success depend upon the chronicity of the infection and the ability of the brain to wall off the infection. Abscesses which have a surrounding wall may be drained by repeated punctures, or by the introduction of a small tube into the cavity. Those which are more acute do not offer a favorable prognosis nor a field for successful surgical therapy.

Pneumocephalus or Aërocele

A fracture of the skull which passes through the paranasal sinuses or mastoid air cells may be accompanied by air within the cranial cavity. Sneezing, coughing, straining or swallowing is necessary to force air through the bony and dural defect into the cranial chamber. The air may be located within the subarachnoid spaces; the subdural space; the brain or the ventricles. Air may often fill the frontal lobe and extend backward into the parietal lobe. The shadow is usually round or oval and projects backward from the frontal lobe. The cavity always communicates with the frontal or ethmoid sinus by an opening

which may be so minute as to be overlooked easily. The symptoms of aërocele are mainly those of increased intracranial pressure. A cerebrospinal fluid discharge is usually present and rhinorrhea after sneezing or a change in posture is almost pathognomonic. X-ray films will furnish an absolute diagnosis. Dandy[2] has reported 28 cases of aërocele and has suggested an operative method by which a transplant of fascia lata is used to repair the dural tear.

Post-Traumatic Symptoms

The most common complaint of patients who have apparently recovered from a skull injury is headache. The majority of patients complain of generalized pains in the head which are not well localized and which are increased by changes in posture. A smaller number complain of well-localized headaches which are persistent and unchanging in their location. The first group may be benefited most in a prophylactic manner by insisting that the patient remain flat in bed for a minimum period of two to three weeks. Penfield[6] has shown that the second group of patients have a collection of fluid in a localized portion of the cerebral subarachnoid spaces. In his opinion this accounts for their severe headaches. He has provided relief for these patients by substituting air, introduced by lumbar puncture, for the fluid. The air is later absorbed.

Dizziness, which must be differentiated from a true vertigo, is also a common complaint. Upon close questioning of the patient it may be developed that the complaint is really of unsteadiness upon stooping or looking upward. If the patient remains flat in bed for a sufficiently long period, this symptom is less likely to be present. True vertigo, in which objects rotate about the patient or vice versa, may follow a basilar skull fracture in which the eighth cranial nerve is injured.

Residual symptoms due to organic lesions of the central nervous system depend entirely upon the extent and location of the injury. Hemiplegia, or a monoplegia, may occur, but if there has not been an actual destruction of brain tissue the degree of recovery may be most striking. Daily physical therapy treatments consisting of massage, passive movements, electricity and active exercises should be employed to advantage in these patients. Facial paralysis, peripheral in type, may be the result of an injury to that nerve in its course through the facial canal. The physiological function of this nerve may be interrupted by hemorrhage within the facial canal and under such circumstances, aided by a supporting splint for the facial muscles and physical therapy, the degree of recovery may be striking. Residual sensory symptoms from cortical damage are rarely encountered. Aphasia may occur as a part of a hemiplegia, but unless the cortical damage is enormous, recovery may be expected. Mental symptoms may persist for a long period of time following a skull injury. They may consist of disorientation, loss of memory, emotional and habit changes.

Convulsions, which usually begin as focal attacks, may follow immediately upon the receipt of a skull injury or their onset may be long delayed. In the majority of cases, convulsions do not occur. It is impossible to prognosticate the occurrence of convulsions upon the location or extent of the brain injury. The basic status of the patient's nervous system probably plays a large factor in their development. In those cases of definite focal attacks which are followed by motor impairment, plastic cranial operations may be of service.

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A PHYSICIAN'S PHILOSOPHY

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As medicine becomes more openly exposed to public view, physicians will continue to be benefited by an increasing number of comments and criticisms and be given the opportunity of seeing themselves as others see them. The fronts on which medicine has been conducting its campaign of reform are standardization of hospitals, clinical records, requirements for graduation, staff clinics and in general standardization of medical and surgical methods. The reforms and progress accomplished have received the enthusiastic approval of the medical profession, and from the public some acknowledgment, but no vociferous demonstrations. The physician and the patient view the practice of medicine from different angles. It is the purpose of this paper to consider the philosophy of a physician, a subject that has received some comment recently from those outside the medical profession. An eminent journalist in the course of a lecture to a medical society said that when he was in need of a physician for himself, he would seek one with some philosophy and it was implied that the search might be prolonged. Another occasion was an address of welcome given by a college president to a national medical convention. The theme and substance of this discourse were that specialism had robbed medicine of coördinated knowledge of man and left physicians little or no philosophy of life.

A jurist in a very interesting after dinner speech deplored the fact that in scholarly attainments, medicine had deteriorated, could no longer be considered a learned profession and was far removed from any form of culture deserving the name of philosophy. Such criticism should receive the serious consideration of physicians and no attempt will be made here to refute it.

However, it may be stated that there are many philosophies, not necessarily conflicting but colored by the various experiences upon which they are founded. Men of the sea are inclined toward fatalism; statesmen believe that majorities cannot be wrong; the American colonists pinned their faith in liberty; teachers are confident that education is the hope of the world; Aristotle taught that the mean between extremes was universally the best; shoemakers think there is nothing like leather, Plato maintained a philosophy of idealism, and similarly a physician's philosophy is shaped and branded by the experiences and traditions upon which it is founded.

As a preliminary to a discusion of this subject there must be a settled and definite understanding of the sense in which philosophy is used. Philosophies are divided into two classes—cosmic and personal. The former refers to speculative discussions of the nature of the universe. It is synonymous with metaphysics. This paper aspires to no such ambitious heights.

Personal philosophy is often referred to as the philosophy of life. It is essentially practical, and it serves as a guide which influences or determines a man's actions and conduct. In addition to its practical implication, a physician's philosophy includes such an understanding of the phenomena and affairs of his every-day experience that it forms a basis and a direction for his life's work.

This definition of philosophy is given by Webster and other lexicographers; it covers the sense in which the word is quite commonly used, and the plan which it includes gives a unity to the widely diverse phenomena met with in human experience.

Medicine is concerned with the phenomena of life, and, dissimilar as the various forms and manifestations of life are, they have in common certain basic features inherent in their plasma, the substance that contains the living principle. The microscopic infusoria, the huge saurian monsters, the mammalian giants of the sea frisking about among the icebergs, the minute builders of coral islands, all possess living plasma which in certain basic features is identical. In this respect man is no exception to the rule. No organism that is alive is without its share of this vital substance. And here at this time may be mentioned the fact that living plasma is pos-

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sessed only by individual owners. It is never held in trust. It is never held by a community nor a government, nor a stock company. It is absolutely individualistic.

The inductive method of reasoning does not serve for the development of a philosophy. Its truths and conclusions cannot be reached by methods that begin at particulars and end with general conclusions. All philosophy is a matter of deduction, a process by which a general principle is postulated and from it are deduced particular truths. The general principle or major premise in this discussion is formed by the basic characters of living plasma.

Biologists have enumerated five basic features of plasma. One of these is the power to assimilate nourishment and apply it to its own upbuilding and growth, and a second feature is reproduction, a propensity that has led to the swarming populations that fill the whole earth. All living plasma is possessed of a nervous sensibility by virture of which it reacts to external stimuli. From this characteristic arise all the woes and wars of the world. In addition to these there is inherent in plasma a primordial, elemental tendency toward the evolution of new species possessing better and more complex organisms. In their primary studies and in their professional experience physicians are confronted with such a mass of evidence in support and confirmation of the theory of evolution that, I believe, it may be accepted as a postulate in their philosophy.

No other substance has such aptitude to accommodate itself to the changing and stormy vicissitudes of its environment, and although delicately composed, and in spite of hostile and destructive enemies and forces encountered, life in its various forms has spread to the four corners of the earth and to the length and breadth of the seven seas.

Five hundred years before the Christian era, Heraclites expounded the theory that everything was in a condition of flux, and that change was the very essence of existence. He wept over the fact that man had no firm place upon which to set his foot or rest his soul. Had he gone a step further he would have seen that this ceaseless change was not promiscuous and haphazard, and that it is working toward an end, purposeful and progressive.

Life is not a stagnant pool, it is a flowing river carrying the human race ever to higher standards, to newer and better things, to more complete understanding of his environment and to marvelous revelations of the potentialities within himself.

The drama of the plan of evolution is the greatest thing on earth except it be the end toward which it is directed. A retrospect of the last two thousand years warrants the belief that the future holds for medicine, progress and attainments beyond our most optimistic conceptions. As man can work with the good earth to increase its yield so he may work with the forces of evolution toward his own betterment and the improvement of his condition.

So far there have been mentioned the three following conclusions:

1. Evolution is inherent in living substance. It is the foundation of effort, of progress, of inspiration and of hope.

2. The individual holds in fee simple this life substance with all its potentialities. The progress of a city, community or nation can only mean the sum of the progress of its individuals.

3. The direction and promotion of man's progress is to some extent within his own control, and to the same extent is his responsibility.

If then evolution is the master key of medical philosophy, it is pertinent to inquire into the conditions favorable to its progressive development. This inquiry is the more relevant because at times evolution in man, as well as in the lower animals is interrupted, and processes of retrogression and even extermination supervene.

From the pages of history, from the conditions about us, from the testimony of geology, from biology and other scientific data, it is demonstrated beyond all reasonable doubt that progressive evolution exists only in an environment of struggle. It is essentially a struggle for existence and to a large extent is tragic.

This is not a pleasant aspect of life, but it is the duty of philosophy to state what is and not to describe a Utopia of some man's imaginings. On the other hand Nietsche's view that the battlefield alone can produce progress and supermen, does not seem to be supported by sufficient evidence. However, if there were no wretchedness, no poverty, no wounds and no diseases, there would be no need for, nor development of

charity among men, nor for the evolution of any other humanitarian quality. This, however, was not the line visioned along which the supermen were to proceed. While it can hardly be said that tragedy and progressive evolution are related as cause and effect it must be admitted that the forward march of life from its beginning has been along a road paved with tragedy.

From their lurking places in the jungles and deep seas, monsters dash forth and devour their timorous quarry. Impelled by the hungry cries of its brood, the eagle swoops down upon the shivering lamb and the bullet from the herdsman's rifle ends the venturesome effort, and as night closes down along the mountain side there is heard the wailing of starving eaglets and the plaintive bleating of a bereft ewe. By speed, power, poison, strategy, wiles, fangs, and claws, the carnivora ensnare, entrap, strangle, kill and devour the herbivora, and those of the same species contend in a life and death struggle for supremacy. Carnage is innate to the life of animals; without this struggle they would degenerate, lose their cunning, speed, ability to wrest a livelihood from nature and would disappear. No longer would they be able to fend for themselves or to make provisions for winter storms. Like driven cattle they would be compelled to accept ignominious dole, food and shelter at the hands of a farmer and end their days not among hills and dales and music of mountain torrents, but in the hopeless shambles of the stockyards. The entire course of animal life from its inception has been an intense and tragic struggle, but as a sturdy ship weathers the storm so evolution proceeds on its charted course toward its unknown destiny. In the human race and with full speed ahead evolution continues onward.

In our own day the increasing functional activities of the brain, thyroid and suprarenal glands will produce an increased blood supply to these organs and, eventually, the evolution of the new structural development. On the other hand degenerative processes are evident in the skin and its appendages. The teeth, hair, color and resistance against disease reveal indications of retrogression processes. Probably due to its decreasing blood supply the skin has become an easy prey to inflammations, infections, and cancer. Retrogression changes are evident in the alimentary tract, in the appendix vermiformis, in the colon, in the duodenum, and in the stomach, impairment of function, ptosis, inflammations, infections, ulcers, and cancer are found with increasing frequency.

The telephone and motorcar have taken the place of the sturdy musculature of the legs, the arches of the feet have collapsed and are on the painful path of desuetude.

The inherent pressure urge toward progressive development and evolution is still operating and with undiminished energy. Had there been no agony from searing irons, no disabling contractions in hands and feet, no ravages of smallpox, of typhoid, of yellow fever, of malaria, no abdominal turmors, no syphilis, there would have been no Paré, no Eberth, no Osler, no Gorgas, no Laveran, no McDowell, no Hutchinson, and no medicine nor medical progress.

When efforts to check and stay the adverse forces of devastation fail, individuals and nations go down to destruction. The farflung ranges of the Andes know no more the flourishing Aztecs. The gophers mine the ground where once stood the cities of the mound builders. Of many extinct cities only scanty bits of their former grandeur remain to be exhumed by archeologists. Ancient Babylon, Persia, Egypt, Greece, and Rome have long since fallen and laboriously we dig the story of their greatness from their dead languages. The tragic history of the Eskimo and North American Indians will end probably in their complete extinction.

In this day in the civilized countries of the world unemployment, poverty, class antagonism, crime and fear are increasing, new and untried plans of government are enforced, the dictator is abroad among the nations, and immense armaments of destructions are ready for mobilization.

Lloyd George describes "the world today as a jungle. The nations are prowling through it, snarling and baring their teeth at each other. At any moment a mistaken gesture or misunderstood arrangement may make them spring at each others throats." There would seem to be sufficient trouble and tragedy now, without another Armageddon so soon.

Literature, the portrayer of life and its realtities, always contains a background of tragedy, from Homer's Iliad and the

dramas of Sophocles and Euripides to Shakespeare and Ibsen. The biblical writings are essentially tragic. Comedy and other light forms of literature, as palliatives and narcotics, afford a brief hour of rest to over-strained humanity.

Through mythology, the fantastic religion of the ancient Greeks, there runs a vein of philosophy, fundamentally sound and characteristic of those erudite people. They had clearly seen that without intense struggle, without tragedy or near tragedy, no human progress or development was possible.

Before the goddess Ceres taught the art of agriculture to man, she was forced out of the high heavens and on earth was ignominously transformed into a heifer, and her beautiful daughter Persephone was kidnaped by Pluto and taken to hell. After these and other magic calamities, and through pity for starving men, the goddess inaugurated on earth the art of farming.

Vulcan set up the first forge on earth, made thunder-bolts and fireworks for the King of the Heaven and established among men the art of metallurgy. But this service did not come to mankind without and until that fiery god suffered the most stupendous and spectacular accident ever described in literature medical or profane. He was flung by Jove over the high battlements of heaven, and the reliable Homer says, "He fell from morn till dewy eve, a summers' day, and from the zenith with the setting sun landed on Lemnos, the Ægæan Isle."

Even in medicine the ancient Greek saw inevitable tragedy at its source. Esculapius was delivered after the death of his mother, and, much after the fashion of Romulus and Remus, was kept with a herd of goats, fed on their milk and for years lived among the rule barbarous centaurs from whom he learned their materia medica.

In the literature, philosophy, and religion of the ancient Greeks, tragedy is found as the basis of human development and progress. And this is also true of higher realms of humanitarian ideals. For in the drama of Euripides even Pallas Athena, the goddess of war, wept over the fallen heroes of burning Troy.

There is a prevalent assumption that progress consists of a reduction in man's labor, struggle, tribulation and tragedy, and in an increase in his idlness, leisure, and luxury. However efficacious this assumption may be for inflammatory declamation and as a political slogan, it is, I believe, fallacious and quite pernicious. At least it may be stated that this view of progress is unsupported by the fact of progressive evolution of man or of living things in general.

Necessity and tragedy have developed the best in organic life, and without these two grim and unrelenting drivers, life would become reactionary, void of stimulus for effort, for invention, or for heroism.

Those of us who are habituated to, and have a home in some corner of this jungle would not exchange it for a place in the sun, but a lone individual wandering through this universe among the stars and planets in search of a place to take up a residence as a homesteader would not at the present time be likely to select the earth.

Let us look at the inventions in agriculture. These, if anything, should alleviate the struggle for existence and especially among farmers. The primitive sickle, flail, and threshing floor were abandoned when the reaper, the self-binder, and the threshing machine were invented. One man could do the work of a hundred. Food would be increased a hundredfold. But the laborers were thrown out of employment, riots occurred, poverty was not noticeably abolished and the wail of the farmers is heard in the land.

In a thousand years hence economists will draw final conclusions from data of our machine age, but at the present time there is no sign that the human race has been freed from tragic struggle or from dire want.

The same situation obtains in the field of medicine. Man and his environment are at deadly grips, or at best in a state of armed neutrality. Man is an invader. He must wrest his living from his surroundings, and these are filled with multitudes of enemies, poisons, and destructive forces, and whenever weakness in his skin, blood, lungs, or in any other organ, presents an opportunity to the lurking bacteria entrenched at the very portals of life's citadel, the battle is on. This balance of power is the very status quo of every living organism whatever its standing from the lowest to the highest.

Knowledge is fragmentary and contradictory and especially is this so of attempts to reach fundamental truths. Notwithstanding Mr. Euclid to the contrary, straight

lines curve and parallel lines meet, says Mr. Einstein. Free will and predestination continue their dispute, absolute justice and mercy have not been reconciled, and philosophy is confronted with its own peculiar predicament. The humanitarian factor in life rises like a huge iceberg dead ahead in the course of a speeding ship.

Thousand of physicians give their time, their strength, and their services without thought of compensation, for the relief of suffering, and to save life. The aged and tired physician faces the night and storm along the treacherous mountain trail to the wretched cabin of the mountaineer, and the young interne spends the night to carry a patient through a postoperative crisis. Not hope of reward here or hereafter, not even the peace of mind that smoothes their pillows, but the humanitarian urge to relieve suffering and restore health is the inherent impelling force.

As to the origin of the humanitarian there is wide difference of opinion and much acrimonious disputation. A rare and mysterious visitor like Poe's raven, it may have been driven by adverse winds to these inhospitable shores from the golden gates and gardens of the Hesperides.

It may have been grafted upon the wild and thorny human tree by some beneficent extramundane power. However, although the evidence is not conclusive, it is very suggestive that the humanitarian motive and the physical and psychological faculties may have evolved from potentialities inherent in the primordial living plasma.

Whatever its origin, however incompatible with the struggle for existence, the fact remains that humanitarianism is a power in public opinion, a moulder of ideals, and a director of human actions. Not only this, but it is becoming more and more evident and general in all civilized countries. As compared with such attributes as fear, anger and intelligence, humanitarianism is a recent acquisition. It is immature, inconstant, irregular, and unreliable; but full of power, enthusiasm, and promise. Like Hercules, on occasions it sallies forth and accomplishes heroic deeds.

From its earliest infancy, humanitarianism has been entrusted to physicians to such an extent that it has taken its place as a permanent institution in the household of medicine. Nearby are the hovels and homes of poverty and sickness, of suffering and want, of the crippled and incapacitated, the needy and neglected. The physician with a national reptuation and the destitute sick are neighbors in the better sense of that word. Through arduous effort he has saved their lives and restored their health, and by their faithful coöperation and confidence they have contributed very largely to his progress and success. The poor have always supplied the world's clinical material and in return have received medical care. But the physician has received much more than this. He has obtained a wider human understanding, broader sympathies, a keener and a kinder insight into the perplexities and tragedies of life.

There is no doctor who has sweat blood and dragged a patient from the jaws of death but is thereby changed and made better. Paradoxical as it may seem, the more disinterestedly the doctor has faced and labored for his patients the less he feels the burden of his own tragedies.

After all, in a sense, medicine is a losing game. In spite of every therapeutic expedient, doctor and patient alike fall victim to the grim reaper. Palida mors aequo pede pulsat pauperum tabernum regumque turris. The concrete structures of his hands outlive him.

Probably nothing on earth builds itself into the structure and development of the human race more permanently than does the humanitarianism of medicine. The good that doctors do may be perpetuated down through the generations that follow.

Notwithstanding the appeal of humanitarianism, the struggle for existence is still to be reckoned with, the doctor still must earn his bread by the sweat of his brow. Believe it or not, it frequently happens that the doctor who gives most freely is the one who is the most prosperous. A solution of this paradox is beyond the scope of this paper. But it may be said that a demonstration of unselfish devotion to the interest of patients is a powerful factor in the promotion of a doctor's success, financial and otherwise. This fact is commonly acknowledged, and there are hundreds of well known illustrations. Medicine owes its enviable place in public opinion largely to the generosity and devotion that physicians throughout the ages have manifested in their free services to indigent patients.

But humanitarianism alone will not cure patients, nor will it alone inspire confidence in them. There must be the application of thorough and sound scientific medicine. The physician must know his work and apply it with assiduity. He must have prepared himself with long years of arduous labor. He must continue to keep himself abreast of the medical progress of his day and he must give his time and energy without reserve to the task before him. He has to grapple with man's greatest enemy, a deadly competitor. At the same time he maintains a more friendly competition with his fellow practitioners. And, therefore, even the humanitarian physician finds himself and his progress in the midst of the some tragic struggle that began "when the fish and the tadpole in the paleozoic time, side by side with the ebbing tide, skittered in ooze and slime."

In the domain of philosophy there is little or no reason to believe that evolution or progress can continue except through struggle and tragedy. At present there seems to be no shortage of these conditions.

From the foregoing postulates and premises there are two conclusions that should be emphasized—laws, ordinances and other forms of control and regimentation should be restricted to measures for the security and liberty of individuals in the exercise of their capacities. Beyond this, governmental intervention, however beneficent its intent (*e.g.*, dole, welfare activities, etc.), may become pernicious. However inspiring and necessary material advancement may be, it would appear from the history of the human race that improvement in the standard of living and the progress of civilization will not consist of this form of advancement nor of increased leisure, feasting or other forms of luxury.

NORMAL NUTRITION IN CHILDREN

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Adequate nutrition in children depends on several factors: 1. The proper ingestion of food. 2. The proper digestion and absorption of food. 3. The proper utilization and excretion of the various food elements. These various factors may be affected or disturbed through organic or functional causes; the former may depend on the presence of infections or mechanical causes, the latter on overactivity of body or mind or on poor dietary habits.

Malnutrition in children is a symptom-complex indicating a transition from the normal health. It may be characterized by a failure to gain in weight or an actual loss in weight. The physical development of a malnourished child usually becomes defective. The musculature becomes flabby, the bones are soft and brittle, the abdomen is prominent, and the intestines become sluggish. Nervous symptoms in these children are usually dominant. The child is either irritable and hyper-active or dull and apathetic. As a baby, he usually fails to progress normally, such as sitting up late or walking and talking late in life. The baby usually has a lower power for the digestion of foods, and his poor assimilation of food results in frequent attacks of indigestion and diarrhea and a chronic poor appetite. He usually develops a secondary anemia, sleeps poorly, and presents the picture of being chronically fatigued. Such children usually have poor resistance to infection and are ever susceptible to upper respiratory infections. In older children we have developed faulty postures due to the poor tone of the muscles, also secondary anemias, and frequent gastro-intestinal upsets due to the faulty digestion of food. In these older children we also see such nervous manifestations as bed wetting, nail biting, teeth grinding, extreme irritability, and a tendency in general not to get along with children.

Thus we can readily understand that it is necessary to study the whole of a child's life in order to determine the primary factors involved in malnutrition. We must first exclude all constitutional or local dis-

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eases in the child. There are mechanical factors that alter the normal nutrition of a child, including enlarged tonsils, nasal obstruction, due to enlarged adenoids or defects in the nasal septum itself, and poor teeth. There are physical conditions which lessen the voluntary intake of food, such as chronic nasal obstruction, poor vision, or impaired locomotion. Focal infections may impair the normal nutrition of a child, namely, abscessed teeth, chronically infected tonsils, enlarged cervical glands, nasal obstruction with resultant sinusitis, and pyelitis or chronic infection in the kidney pelvis. Chronic diseases, as tuberculosis or syphilis, will undermine a child's nutrition. Further, any of the childhood diseases, particularly whooping cough, measles, scarlet fever, or diphtheria, may have a permanent effect on the normal development of a child. Finally, repeated, intercurrent infections, as tonsilitis, bronchitis, or cervical adenitis, may permanently impair the nutrition in a child.

There are metabolic diseases which will alter the growth and development of a child. In recent years we have learned a great deal about the glands of internal secretion, namely, the thyroid gland, the pituitary, the thymus, the parathyroid glands, the adrenals, and the sex glands, all of which regulate and control body growth. Further, these glands apparently have a great deal to do with the assimilation of the various food elements, particularly the minerals, fats, and carbohydrates. The cause of various body builds, that is, the long, thin, asthenic type of person, the broad, stocky, sthenic type of individual, and finally the short, obese, or hyper-sthenic type of person is probably explained by the faulty function of the various glands of internal secretion. However, we do still recognize hereditary constitutional types of individuals with apparently normal functioning endocrine glands, such as the infantile type of child who remains underdeveloped physically and mentally, with apparently normal functioning glands of internal secretion. Diabetes and nephritis also belong to the group of metabolic diseases and handicap the normal growth and development of the child.

Among the functional causes which impair the normal nutrition of a child, the most prevalent causative factor is faulty hygiene. Proper health habits are essential to normal nutrition. Regularity of feedings, adequate fresh air, sufficient sleep, proper activity, daily baths, daily stools, and good cheer make for the normal hygiene of a child. These health habits are as important in older children as in infants and the preschool child, and the laxity of parents in requiring such habits in older children probably explains the cause of many cases of maltnutrition in children of school age. Improper health habits in children are frequently caused by faulty examples set by their adult associates. This applies particularly to food habits. Adults have a tendency to develop food consciousness in children with an ultimate negativistic attitude in the child towards other things. This negativism reveals itself in the form of anorexia, chronic or recurrent vomiting, temper tantrums, and in older children psychic disturbances with inability to get along with other children and frequent failure in school work. Thus the establishment of faulty food habits in the infant and young child may seriously handicap such a child for years to come.

Finally, the development of a well nourished child depends directly on supplying the proper food elements. Only in recent years have we learned that supplying carbohydrates, proteins, fats, and minerals in adequate caloric amounts is not enough. We have come to realize that we must supply certain vital food elements in the diet of a child to promote normal nutrition. We call these elements vitamins. The various nutritional diseases, as rickets, scurvy, beriberi, pellagra, and xerophthalmia, have almost been abolished today, due to our modern knowledge of vitamins. We recognize in general five distinct vitamins, namely, Vitamins A, B, C, D, and E, Vitamin B being divided into two separate divisions called B_1 and B_2. Vitamin A is considered the growth vitamin; it is found particularly in cod liver oil, egg yolk, beef liver, spinach, carrots, prunes, butter, and whole milk. Vitamin B regulates the normal functioning of the nervous tissue and is found mainly in whole grain cereals, yeast, liver, peas, beans, spinach and whole milk. Vitamin C controls the normal development of the endothelial cells, the lack of which causes scurvy, manifested by hemorrhages from the gums and into the bone tissues. It is found mainly in orange juice, tomato juice, lemon juice, pineapple juice, and less abundant in

spinach, rutabagas, peas, strawberries, bananas, and apples. Vitamin D regulates the mineral metabolism of the body and prevents rickets. It is found particularly in cod liver oil, halibut liver oil, salmon oil, butter fat, egg yolk, and whole milk. Vitamin E controls fertility and lactation in the female and to a less extent controls the spermatozoan development in the male. Vitamin E is found abundantly in wheat germ oil, lettuce, corn oil, whole grains and all leafy green vegetables. Vitamin B_2, or, as it is sometimes called, Vitamin G, controls growth and prevents the disease called pellagra. It is found abundantly in egg yolk, kidney, liver, yeast, spinach, and whole milk. Therefore, supplying the proper vitamins in conjunction with an adequate caloric diet, consisting primarily of whole milk, eggs, whole grain cereals, green vegetables, fresh fruits, meats, fowl and sea foods will go a long way in the development of a well nourished child.

In conclusion, normal nutrition in children is dependent on various factors. Only through repeated and frequent physical examination of infants and children can physical defects be discovered and corrected at an early date. Likewise, foci of infection and disturbances of the glands of internal secretion should be detected early in life and corrected wherever possible. The various childhood diseases can be prevented or greatly ameliorated today, so that permanent damage need not result from them. Only through the education of mothers can we hope to supply the proper hygienic environment for the growing child. Children should be taught from early infancy to eat the proper foods, particular attention being given to the vitamins. If proper health habits are once well established in the infant and preschool child, they become a matter of routine in the older child. Only through the coöperative efforts of parents, teachers, and physicians will the vast army of malnourished and underdeveloped children be cut down so that society in the future will not be handicapped by adults who are mentally and physically retarded.

THE DOCTOR AND MALPRACTICE

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Ignorance of the law excuses no one. This legal maxim applies to doctors as well as to the laity. In these days the malpractice "racket" is abroad in the land. It behooves every doctor to know his rights and liabilities. In order that doctors may acquaint themselves with the law in relation to medicine, it is the purpose of the Medico-Legal Committee of the Michigan State Medical Society to have articles appear in the JOURNAL from time to time regarding this most important matter. As a preliminary it is suggested that physicians avail themselves of books and other material relating to medico-legal matters.

We suggest a reading of the cases presented each week in the *Journal of the American Medical Association.* The American Medical Association have also published a large volume entitled "Medico-Legal Cases," Abstract of Court Decisions —1926-1930, which is invaluable. We would also suggest the reading of the Annual Report of the Medico-Legal Committee which is published in the JOURNAL OF THE MICHIGAN STATE MEDICAL SOCIETY.

Among the books which will be of interest are the following:

Courts and Doctors, by Lloyd Paul Stryker, published by the MacMillan Co., New York, price $2.00. This book contains authoritative information and discussion on medico-legal questions based on the author's long experience in handling legal problems affecting the medical profession. For many years he was general counsel for the Medical Society of the State of New York.

The Doctor in Court, by Edward Huntington Williams, M.D., published by the Williams and Wilkins Co., Baltimore, Md., price $2.50. A book of Experience of the Expert Medical Witness, invaluable to the

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physicians who may be called to the stand, and presenting curiously interesting sidelights upon the legal and judicial practice, with an appendix in expert testimony by Charles W. Fricke, Judge of the Superior Court of Los Angeles County. An interesting book.

Doctors and Juries, The Essentials of Medical Jurisprudence, by Humphrey Springstun of the Detroit Bar. Published by P. Blakiston's Son and Co., Inc., Philadelphia, price $2.00. This little book by one of our Detroit lawyers I can heartily recommend. It should be read by every physician. There is no book published that I know of that has all the essentials so compactly arranged. Buy it because of the wealth of information you will receive.

Medical Men and the Law, by Hugh Emmett Culbertson. A modern treatise on the Legal Rights, Duties and Liabilities of Physicians and Surgeons; is a larger book that I recommend very highly. Published by Lea and Febiger, New York.

Medical Jurisprudence, by Elmer D. Prothers, B.S., LL.B. Published by the C. V. Mosby Company. A statement of the law of Forensic Medicine; is an excellent small textbook.

Medical Jurisprudence, by Carl Scheffel, Ph.B., M.D., LL.B. Published by P. Blakiston's Son and Co., Inc., Philadelphia; is the book we have been using the last two years in our course in the Medical Department of the Wayne University. I can recommend it highly.

There is also a series of pamphlets issued by some of the insurance companies doing malpractice business that are very good. The title of one is "The Doctor and the Law." I will be glad to give the name of the company to any who inquire. The name is not given because it might be thought that the writer was advertising the said company. If our doctors will get one or more of these books and read them I am sure much good will result. The Medico-Legal Committee is ready at any time to answer questions or have matters referred to its attorney for consideration and reply.

PNEUMOCONIOSIS

The Bureau of Mines has recently issued a statement reviewing the literature on the effects of breathing dusts, especially silica dusts. Two further reports dealing with prevention and treatment of dust diseases and some of their economic and legal aspects in industry are to appear later. The material in the report is extensive and few general conclusions are drawn. It is fairly safe to infer, however, that the silicotic lung is more susceptible to bacterial infection than the average lung. This is probably due to the irritation of the respiratory tissues by the inhaled dust particles, which weakens the mucous membranes and renders them susceptible to infection. The toxic influence of certain inorganic dusts on the tissues may be a contributing factor. There are almost as many classifications of stages of silicosis as there are studies of the subject. Thus, the Committee on Standard Practices in Compensation of Occupational Diseases of the American Public Health Association describe three arbitrarily divided stages. Pancoast and Pendergrass suggest the following: (1) peribronchial-perivascular-lymph node predominance type, (2) early interstitial predominance, (3) advanced interstitial predominance, (4) nodular predominance and (5) advanced diffuse or terminal fibrosis. A detailed statement of occupation is important in diagnosis. The mere fact that a man is a miner has slight, if any, value. The cardinal physical observation in silicosis is diminished chest expansion. It is generally accepted, however, that the roentgenogram offers the best and most reliable indication of the lung changes that occur in silicosis, particularly in the early stage. Finally it was agreed at the International Congress on Silicosis in 1930 that, to produce the pathologic condition, silica must reach the lungs (1) in a chemically uncombined condition, although the dust inhaled may be either a natural mixture of silicon dioxide with other dusts, such as occurs in granite, or an artificial mixture, such as scouring powder; (2) in fine particles of less than 10 microns in diameter, and (3) in sufficient amount and over a certain period of time, the latter two factors being reciprocal variants. The minimum of these two factors has not yet been determined—*Jour A. M. A.* Editorial.

THE JOURNAL

OF THE

Michigan State Medical Society

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AUGUST, 1935

EDITORIAL

THE ANNUAL MEETING

The annual meeting of the Michigan State Medical Society will be held as announced at Sault Ste. Marie, September 23 to September 26. There will be a change in the usual routine of the Scientific Sessions. The House of Delegates will meet on the afternoon of Monday, September 23. With the exception of the section on ophthalmology and otolaryngology all scientific sections will be held in general sessions beginning Tuesday evening at eight o'clock.

Wednesday evening will be the president's night, when the president's annual address will be presented. The Andrew P. Biddle Lectureship will be inaugurated.

An array of outside talent of nationally known surgeons and clinicians has been secured for the general sessions and the Andrew P. Biddle oration. The program will also include many men from our own state. No effort is being spared to make the 1935 annual meeting one of the most interesting and profitable that has been held in recent years.

RADIOLOGIC EXHIBIT

Among the scientific features of the annual meeting of the Michigan State Medical Society at Sault Ste. Marie will be a unique exhibit by the Michigan Association of Roentgenologists. This will include diagnostic films as well as specimens, radiographs and photographs illustrating x-ray and radium therapeutics. The exhibit will be in the fullest sense educational, inasmuch as an effort will be made to present, not the rare and the unusual, but findings in the routine of practice. The films will be reduced to a uniform size and the arrangement will be such as to facilitate inspection by the entire membership of the society present, for roentgenology is not in any sense a regional specialty. The exhibits should, therefore, interest all.

Enabling by-laws will be sought from the House of Delegates to authorize the founding of a section on Roentgenology and Radiotherapy. There is a great deal to commend such a movement. Both in its diagnostic and therapeutic phases, roentgenology or radiology, which includes also x-ray and radium therapeutics, concerns almost all branches of medicine and surgery. The effectiveness of massive dose therapy is being widely recognized by the profession. A clearer understanding of its scope and limitations on the part of the internist and the surgeon who refer cases to the radiotherapist is necessary if the best results are to be obtained.

The roentgenologist is a consultant. Instead of functioning as pathologist in the examination and interpretation of specimens, he comes in direct contact with the patient whom he examines in a particular manner, and correlates his findings with clinical findings of the referring physician or surgeon. Each requires the experience of the other in the interest of the patient, and the harmonizing or correlation of data obtained by each in examination is what is meant by consultation.

There will be, also, members of the Michigan Association of Roentgenologists to answer questions or to discuss the various lesions illustrated by the exhibits. This bids well to be one of the most attractive features of the annual meeting, which along with the excellent scientific program will well repay attendance.

MEDICAL ECONOMICS

The two medical colleges of this state have signified their willingness and intention to establish chairs in Medical Economics. This is interesting. Medicine has always had its economic phase though in the past it has not assumed any systematized form. A new subject to be taught as an entity of the medical curriculum, it will doubtless take some time before it assumes a definite scope.

Whether it will be taught by a physician or by a teacher of economics we have not been informed. One medical school in the east evidently feels that the subject is best taught by a professor of economics, who accordingly has been sent about the United States visiting medical schools and physicians in private practice and hospitals to acquaint himself with medical economics throughout the country. This seems wise. We have had occasion to review Medical Economics by Dr. A. C. Christie of Washington, the only special work on the subject we have seen; our impression was favorable. Though brief, it will serve as a basis for instruction.

One difficulty with the subject is that it invades the emotional field. We all have our own views on it, and hold them tenaciously, since our livelihood is so intimately concerned; we do not readily give them up as we do a purely scientific belief if it is proved incorrect. The salaried professor may not see things in the same way as the practising physician who feels his independence threatened by possible hastily considered change.

DOCTORS AS LEGISLATORS

Within the past year several elections have taken place in Canada. A fact that should not be without interest to the medical profession is the number of physicians who have been elected to the various provincial legislatures. In Ontario, there are twelve doctor members of parliament. The latest province to hold an election is New Brunswick, when five physicians were elected. Politics (using the word in its best and original sense) of the present and future will be concerned to a large extent with matters of public and personal health so that a good leavening such as a dozen physicians could afford as members of the state legislature, could not but redound to the best interests of the body politic.

The importance of government in a democracy cannot be too strongly emphasized, and of equal importance is an enlightened public. In 1867 when the suffrage in England was extended to all males of twenty-one years and over, one statesman, fearful of the result, exclaimed, "We must educate our masters." Through the joint committee on public health education of Michigan an effort has been made to educate or, perhaps better, to inform the voter and future voter in regard to the essential facts underlying the science of medicine as taught in our medical schools. Many must yet be reached if resort to self medication and cultism is to be reduced, and if there is to be greater appreciation of what scientific medicine offers.

There seems a more or less close relation between public enlightenment in the basic facts and principles of disease cure and prevention and the assistance a few medically trained independent representatives in the legislature might render to the public at large.

MEDICAL PAPERS

Medical contributions have increased in quantity during the past decade. It is a healthy sign since it is to a large degree an indication of greater personal attention to one's work. Concurrent with the increase in the number of papers offered for publication is the growth of post graduate teaching. Doubtless many papers have been written with no thought of publication. The writer always benefits by committing his thoughts to writing. There is nothing, not even talking it over with someone, that so clarifies one's thinking as the use of the pen or pencil. One carefully prepared paper a year should be the aim of every doctor. Such a paper if not published, if born to blush unseen, is a veritable graduate course on the subject, to the person who puts into it his best efforts. It need not be long. The greater one's mastery of his subject, the fewer words he requires to express his views.

There should be some reason for one's effort. If he has nothing to say, it is better that he not attempt to say it. His contribu-

See preliminary announcement Annual Meeting under "Society Activity"

tions should grow out of some experience or method or unusual case. Case histories carefully prepared are, as a rule, contributions worthwhile. An occasional review of the medical literature on a certain subject may be also of value. A case well worked up, particularly if it is outside the routine of practice, is of value if presented in readable form, which many are not. It is a common experience to receive a paper for publication in which the author's introduction and comment are prepared with care, but in which his illustrative case or cases are thrown together in the crudest fashion, with essentials and non-essentials presented without discrimination and with many abbreviations unintelligible to even the average medical reader. As an effort towards the improvement of medical literature, we would suggest fewer papers and those prepared with emphasis upon the case history, that is, history of the medical or surgical case, which stresses not the commonplace so much as the out-of-the-ordinary. The so-called "textbook" paper has no demand with the keen competition for space in our national, state and independent medical periodicals.

THE NEW AND THE OLD

The *New York State Medical Journal* takes great satisfaction over the election of a member of the profession of the state of New York as Speaker of the House of Delegates of the American Medical Association. The *New York State Medical Journal* has paid Dr. Van Etten a glowing tribute:

> For a long time New York has been proud of Dr. Nathan Van Etten. His wise counsel, his calm judgment, and his good humor, in addition to his studious efforts to grasp the current topic, are characteristics which have endeared him to us who have been privileged to work with him. His consistent and persistent stand against the temporary trend of the day to stampede organized medicine into socialized medicine, and his sturdy defense of the general practicing physician are well known in this, his home state. New York is happy for the distinction he has brought the Medical Society of the State, whose President he has been. In his elevation to the Speakership, we find justification and ratification of his position on pending social medical questions.
>
> Having served the profession so well, he is worthy of the high honor which the delegates of the A.M.A. have bestowed upon him. We venture to predict that he will rule the House less through the technicalities of parliamentary law than by the magnetism of his personality.

Dr. Van Etten succeeds Dr. F. C. Warnshuis. For over twenty-one years secretary of the Michigan State Medical Society, Dr. Warnshuis has held the position of speaker of the House of Delegates of the American Medical Association for a period of eighteen years. This is a long time to hold any one office and the fact that Dr. Warnshuis occupied the position so long is *prima facie* evidence of service rendered, his executive ability and his mastership of the rules of parliamentary procedure.

Our Queer Anatomy

Where can a man buy a cap for his knee?
  Or a key for a lock of his hair?
Can his eyes be called an academy,
  Because there are pupils there?

What jewels are found in the crown of your head?
  What crosses the bridge of your nose?
Do you use, in shingling the roof of your mouth,
  The nails at the end of your toes?

Can the crook of your elbow be sent to jail?
  If so, what did he do?
Where can you sharpen your shoulder blades?
  I'm sure I don't know, do you?

Can you sit in the shade of the palm of your hand
  Or beat on the drum of your ear?
And if the calf of your leg ate the corn off your foot,
  Why can't we have corn on our ear?

—ANON.

OTOSCLEROSIS IN IDENTICAL TWINS

George E. Shambaugh Jr., Chicago, adds three more instances to the two instances reported previously of otosclerosis in identical twins. He states that if the premise were strictly correct that the hereditary anlage is exactly equal in a pair of identical twins, then one could say with assurance that there are external influences which can affect the age of onset and rate of progress of clinical otosclerosis, and this would be saying a great deal. However, there is one disturbing fact that must be taken into account and that is that identical twins develop from the same egg, but from different halves of the egg, and their hereditary environment may differ slightly just as the two halves of any person are slightly different. Thus, otosclerosis often begins first in one ear and may occasionally become very advanced in this ear before the onset of progressive deafness in the opposite ear. The difference in the twins may correspond only to the difference in the two ears of any one with otosclerosis. However, the fact that the lesion developed first, in every instance, in the twin who was much more susceptible to head colds is at least suggestive evidence that head colds are an activating influence on otosclerosis. On the basis of the observations in identical twins head colds apparently have an activating influence on otosclerosis similar to the influence of pregnancy. This conclusion coincides with clinical experience in the majority of patients with otosclerosis. It does not seem to be due to direct extension of infllammation through the eustachian tubes, though this possibility must be considered. The effect may be entirely systemic, by blood stream transmission of toxins. Further observation of otosclerosis in identical twins will confirm or refute these conclusions. Meanwhile, one can feel justified in any reasonable measures to reduce the susceptibility to head colds in persons with otosclerosis. (*Journal A. M. A.*, April 6, 1935.)

A MOMENT OF MEDICAL HISTORY

W. T. D.

THE DEVELOPMENT OF THE OPHTHALMOSCOPE

The ophthalmoscope which was introduced to ophthalmology and medicine by Hermann von Helmholtz was the outcome of purely academic researches on a minor, but vexing, problem of optics. Why did the pupils of the eye ordinarily appear black, and why, under certain circumstances, did the eyes of some animals appear luminous? Anatomical studies on the eye afforded no solution, and physiological experiments on conditions favoring luminosity were slow to accumulate.

From antiquity, the glow appearing in the eyes of cats and other animals was thought to be an inherent characteristic associated with the physiology of the eye. The eyes were supposed to emit luminous fire during certain emotional states. Normally, however, the pupils appeared dark.

As early as 1704, Jean Méry made a significant observation on the eye of the cat. By immersing a cat in water, he found that the pupils of the eyes became dilated following the suspension of respiration. On looking at the eye, he noticed that the pupil, instead of appearing black, became transparent, and that he could look into the interior of the eye to see the entrance of the optic nerve and the blood vessels of the fundus. Méry incorrectly believed that the surface of the cornea of the eye was uneven or rough, and that a layer of water filled the irregularities and made the cornea transparent so that the interior of the eye could be seen. The correct explanation, however, appeared five years later with de la Hire, who pointed out that the normal refraction of the cornea was prevented when the latter was covered by water. Rays of light leaving any part of the fundus of the eye were not refracted by the cornea, but were allowed to diverge much as though there were no refractive media involved.

During the later eighteenth and early nineteenth centuries, cases were reported of human eyes which presented a luminous appearance. Fermin, in 1796, recorded such a condition in the eye of an Ethiopian albino, and Scarpa, in 1816, described a similar condition in an eye having a diseased fundus. In 1817, Beer also described a case in which the eye showed luminescence. Because of the iridescent character of the glow which resembled that of a cat's eye in twilight, he applied to it the term, "amaurotic cat's eye," which has even persisted to the present.

A few years previously, in 1810, Prévost demonstrated that the eyes of animals did not appear luminous in an entirely darkened room. The luminosity was simply the reflection of light which had entered the eye through the pupil and was, in no way, generated by the eye. During the same year, Gruithuisen demonstrated that the reflecting surface of the eye was the tapetum of the choroid layer. Rudolphi showed further that in order to detect the luminous reflection, the observer must place himself so that he looked into the eye in a certain specific direction.

In 1839, Behr studied a case in which the iris was entirely absent and the pupil appeared reddish. He found that the appearance was manifest only when the observer looked into the eye in a direction parallel with the light rays which fell into the eye. The glow of an eye lacking an iris was similar to the pink of the eye of an albino rabbit, in which the iris is transparent.

With increased knowledge about "cat's eye amaurosis," it seemed that there were two types of eyes, those which emitted a glow and those which did not. A rational explanation for the difference was not apparent. The normal human eye did not appear to show luminescence. There was some reason, then, why the pupil seemed black under all normal conditions.

Kussmaul (1845) performed an interesting experiment on an excised eye, which bore on the problem. He removed the cornea, with no change in the appearance of the pupil. He then removed the crystalline lens and immediately the retina and its blood vessels became visible. It was thus evident that the lens, in some way, was responsible for the lack of reflection from the fundus of the eye. When the vitreous humor of an eye was sucked from the globe, the latter collapsed, bringing the lens and retina closer together than normally. The retina was thus brought anterior to the fo-

cus of the lens and could then be seen as if magnified by a convex glass.

Two publications, one appearing in 1846, by William Cumming of the London Hospital, the other in 1847, by Professor Ernst Brücke of Vienna, demonstrated that, under favorable conditions, the normal human eye could be rendered luminous. Cumming placed the person whose eye was to be examined at a distance of ten or twelve feet from a gas light in an otherwise darkened room. When the flame was so shielded that all light, save a beam cast upon the face and eye of the subject, was excluded, the observer could, by placing himself as near the illuminating beam as possible, observe a reddish luminescence in the pupil. This was a reflection from the background of the eye. Cumming noted that a slight movement of the subject's eye changed the luminescence to a whitish tint, the reflex from the optic nerve head. He became convinced that with proper illumination one would be able to look into the fundus of all normal eyes, and that when this was not possible, eye disease was indicated. Cumming used atropin to dilate the pupil in many cases that he studied, finding, in this way, that better images were produced.

Brücke, who had for several years been interested in analyzing the reflection of the eyes of numerous mammals and fishes and the structure of the tapetum, independently discovered the phenomena of Cumming. One time as Brücke was standing in his lecture room between a hanging lamp and the door, he noticed the luminous glow in the eye of a student who was entering the room. The student was not an albino and appeared to have normal eyes. On repeating the observation under various conditions, Brücke found that an arrangement of light and screens, very similar to that of Cumming, gave the desired glow. He also found that by the use of a candle and an opaque screen in a dark room, a luminous glow could be induced in the eye of a patient when the screen and candle were held close to the visual axis of the observer in such a way that the screen shielded his eye from the candle. Brücke, in his publication, recounted an observation of a friend of his, Karl von Erlach, who had at times noted a peculiar glint in the eyes of persons standing in front of him. The lenses of his eyeglasses, which were concave, reflected light into the eyes of persons in such a way that he could observe a reddish glow in their pupils. This accidental observation of von Erlach embraced the principle which, a few years later, was adapted to the ophthalmoscope.

In 1847, an English mathematician devised an instrument for looking into the interior of the eye, but when the significance of the instrument was not appreciated by the leading English ophthalmologist, Wharton Jones, it was discarded as a useless toy. The instrument, which was constructed by Charles Babbage, "consisted of a bit of plane mirror with the silver scraped off at two or three small spots in the middle fixed within a tube at such an angle that the rays of light falling on it through an opening in the side of the tube was reflected into the eye to be observed, and to which one end of the tube was directed. The observer looked through the clear spots of the mirror from the other end." Since Babbage's instrument was never introduced into ophthalmological practice nor described for several years, it had no vital relation in the sequence of events dealt with here.

The problem of the appearance of the pupil under different conditions was finally solved by Hermann von Helmholtz, who made a complete analysis of the refracting properties of the eye and demonstrated conclusively why the pupil appeared dark under certain circumstances and light under others. Helmholtz found that a model of the eye could be produced by removing the eye lens from the ocular tube of a microscope and placing the tube in an inverted position over a white card with the field lens uppermost. The lens of the ocular represented the crystalline lens of the eye, the ocular tube the globe of the eye and the white card the retina or rear of the eye. In the ocular tube, the length of the tube was equal to the focal distance of the lens. An observer looking through the lens found that it appeared black like the pupil of the normal eye. If the convex lens of the ocular were taken away or if the distance between the lens and paper surface were altered materially, the observer at once saw the white surface of the paper.

The close similarity between the phenomenon exhibited by the microscopic ocular and the human eye suggested that the problem was one of optics. Helmholtz made a

careful and mathematical analysis of the path which rays of light must take in such an optical system according to the physical laws of refraction of light. Rays of light leaving a luminous source passed to the surface of the eye and through the refractive media of the eye in certain fixed directions to reach a focus at a particular spot on the fundus of the eye. Most of the light was absorbed, but some was reflected. Light leaving the surface of the fundus passed through the refracting media of the eye along lines which coincided with the incident rays and came to a focus at a point coinciding exactly with the original light source which gave rise to the reflection on the fundus. The reason, then, that the reflection of light passing into the eye could not ordinarily be observed was that the observing eye could not be placed at the point of convergence of light rays coming from the reflecting center of the retina, since the light source was already at this point.

Cumming's and Brücke's arrangement of light sources and screens and the conditions exemplified in the dilated pupils of the eyes of cats and other animals, as well as the condition in albinos having transparent irides, were now explained. The observer was sufficiently close to the axis of reflection that a slight amount of the reflex could be detected. Helmholtz decided that the optimum reflection could be obtained if the observing eye were located exactly at the site of the illumination which lighted the eye. Once the problem was clearly outlined, a simple optical arrangement offered a solution. If a light source were placed at the side of an eye to be observed, light could be reflected into the eye by means of an obliquely arranged glass plate. That portion of the light which was not absorbed within the eye was reflected from the fundus to the glass plate. A considerable portion of these rays was reflected back to the luminous source while the remainder passed through the glass along the visual axis to be noted by an observer. Through optical laws, Helmholtz had thus confirmed the chance observation of von Erlach.

Using several layers of thin glass plates, Helmholtz observed the character of the reddish reflection of the eye and found that certain details of the interior of the eye were visible. He could see the arteries and veins of the fundus and the optic nerve head as distinctly as they could be seen in the dissecting room. He found, further, that a concave lens placed behind the mirror-like glass plates brought the retinal images into closer focus. Employing these principles, he constructed an instrument which he called *Augenspiegel* or eye mirror, consisting of small glass plates, actually microscopic cover slips, placed obliquely in a holder the internal surfaces of which were darkened with black velvet. A socket was provided for concave lenses and a handle was attached. With this device, an observer sat close to a patient and reflected the image of the light source into the eye to be observed, the fundus image being apparent to the observer looking through the concave glass. An alternate method of using the instrument, the indirect method, was also suggested. In this, the observer sat at a little distance from the subject and held a convex lens between the *Augenspiegel* and the eye to be observed.

Helmholtz, appreciating the practical significance of his invention, suggested that, with his *Augenspiegel* or ophthalmoscope, pathological changes in the blood vessels of the retina, in the optic nerve head and in other features of the fundus could be studied. The instrument also could be used to detect opacities in the refracting media of the eye and could be used as a method of testing visual acuity and the refractive characters of the eye. About forty years after these studies, Helmholtz stated "all that was original with me in the matter was that I went to ask how the optic images could be produced by the light coming back from the illuminated eye. All my predecessors had failed to put this question to themselves. They had stopped in the middle of their way, instead of going on to the end. As soon as I had answered that question, I saw also how an ophthalmoscope could be constructed and it took me only two days to do it and successfully to experiment with the new instrument."

Probably because of the mathematical treatment in Helmholtz's monograph, medical men were slow to appreciate the significance of the ophthalmoscope for nearly a decade. In the hands of a few ophthalmologists, however, the instrument was modified and found approval.

Make your reservations at the "Soo" Now.

A few months after Helmholtz's publication, Epkens substituted for the glass plates of Helmholtz a silvered mirror with a small oval of silver removed, through which the observer looked at the fundus. This modification which resembled the earlier instrument of Babbage became characteristic of almost all subsequent models. In the next year, Reute found that a concave mirror was superior to the flat one of Epkens. Coccius, in 1853, devised an alternate arrangement consisting of a plane mirror of glass or metal having a convex condensing lens. A significant addition to the ophthalmoscope was made in 1852 by Rekoss, an instrument maker of Königsberg, who provided rotary discs (Rekoss discs) which contained lenses. By rotating the disc, an appropriate lens could be placed into the optical axis of the ophthalmoscope. In this way the optical variations in the observed and observing eyes could be equated. Numerous other modifications were suggested by Zehender and Jaeger in 1854, Leibreich in 1855, Burroughs in 1856, Nachet, Demarres, Beale and others. Some of the modifications of transitory importance were binocular devices, stationary instruments and demonstration models with which an instructor and student could view the fundus simultaneously.

In the decade between 1860 and 1870, ophthalmoscopic data on the pathology of the eye accumulated and it was discovered that pathology of the fundus was frequently a symptom of serious general disease. Through the work of von Graef, Allbutt, Hughlings Jackson and others, eye symptoms were discovered for brain tumors, hydrocephalus, epilepsy, Bright's disease, diabetes, anemia and dozens of other conditions. Thus, the ophthalmoscope was introduced to routine medical practice as an important diagnostic aid.

Ophthalmologists improved the instrument for refractive purposes. Numerous ophthalmoscopes were devised, many with differences of only minor importance, a few with changes which were of real value. Loring of New York improved the instrument in three ways. He devised Rekoss discs in which more than a score of convex and concave lenses could be used; he introduced a tilting mirror and a mechanism by which the lenses could be closely approximated to the eye hole of the mirror. Wadsworth invented an obliquely set mirror which enabled the observer to look straight through the lenses instead of at an angle. A further improvement of the ophthalmoscope was suggested by Dennet (1885), who provided the instrument with a minute incandescent bulb placed in the handle so that light could be reflected into an eye. Since the only source of current was a large storage battery, the instrument had the same limitations of portability as earlier models. Crampton developed an instrument having a small battery within the handle. De Zeng modified the instrument, as did Marple, to make the electrical instrument portable and efficient. Since the electrical ophthalmoscope was portable and could be used in any position for bedside practice, avoided glare in the eye of an observer and was easier for beginners to use, it soon became the most important adaptation.

INSULOGENIC STIMULATION OF SEXUAL DEVELOPMENT

George A. Williams and Robert L. Williams, Atlanta, Ga., point out that the administration of insulin to a poorly developed nondiabetic girl 8½ years of age resulted in striking acceleration of body growth and sexual development. This was manifested by increase in height and weight, stimulation of the mammary glands, ovaries and uterus, assumption of the adult type of fat distribution, and a growth of fine body hair. Discontinuance of insulin was followed by prompt regression of secondary sexual phenomena. Body growth continued, but at a less rapid rate. Resumption of insulin after a lapse of ten months resulted in prompt reappearance of the sexual phenomena, to regress as soon as insulin was again omitted. (*Journal A. M. A.*, April 6, 1935.)

JEJUNAL ULCER

Roscoe R. Graham and F. I. Lewis, Toronto, Ont., base their remarks on jejunal ulcer on their observation of forty-three cases, of which a careful and exhaustive follow up of the patients who have been submitted to a gastro-enterostomy shows a much higher incidence of jejunal ulceration than is usually suspected. A persistent gastro-intestinal disability in a patient who has had a gastro-jejunostomy demands a careful and thorough investigation. Roentgen investigation of such patients is more efficient if the clinician and radiologist cooperate as a team. Jejunal ulceration is a surgical lesion, and operation should be urged as soon as the patient's condition permits, provided the diagnosis is thoroughly substantiated. Block resection of the stomach and jejunum, with end-to-end anastomosis of the jejunum, and either a Billroth I or retrocolic Polya reconstruction of gastric continuity is the ideal procedure. A barium enema should be a routine procedure in the investigation of any patient suffering a gastro-intestinal disability after a gastro-enterostomy. The ideal operation for a gastro-jejunocolic fistula is a block resection of stomach, jejunum and colon, with triple anastomoses, together with a cecostomy.—(*Journal A. M. A.*, Feb. 2, 1935.)

DEPARTMENT OF SOCIETY ACTIVITY

Edited by The Secretary

THE LOCKS AT SAULT STE. MARIE

THE 70TH ANNUAL MEETING OF THE MICHIGAN STATE MEDICAL SOCIETY

One hundred and fifteen years ago the Medical Society of the Territory of Michigan was founded. Seventy years ago the Michigan State Medical Society, in essentially its present form, came into being. Annual meetings for the discussion of scientific papers and the problems of the profession have been the rule since the Society was first formed. For sixty-nine consecutive years an annual session has been held and the transactions published in full by the Society.

We meet this year in a region still reminiscent of that Michigan so familiar to the founders of this society—historically rich in reminders of a period antedating this—the period of the early French Explorers—of Brule and Nicolet, who knew the Sault in the early 1600's.

To this interesting City on the Locks, the Michigan State Medical Society brings for your instruction and your enjoyment the best talent from its own membership, and from other states, speakers of exceptional ability, famed in their special lines of work, to discuss with you the newer things in medicine, surgery and the specialties in a well rounded program.

Can you afford to miss the unusual opportunity to keep abreast of scientific developments?

Your special attention is called to the Wednesday afternoon program—a round table—a student-professor Clinical Pathological Conference where each is given the opportunity and expected to take part in the discussion.

A scientific exhibit—the best the Society has ever put on.

A commercial exhibit—most distinctly worthwhile.

Accommodations? Yes, ample. The Soo has no Atlantic City Hotel but you can be assured of a comfortable bed. If you prefer, you may stay at any one of the many comfortable homes in the city. The claim is made, and well founded, that the Soo is the most hospitable city in the state.

Canada offers you hospitality — The Windsor Hotel or the smaller Algonquin on the Ontario side invite you to take the ten minute ride on the ferry and stay with them.

The Michigan State Medical Society presents its guests:

Dr. John H. Musser, Tulane University, Professor of Medicine.

Dr. George W. Hall, University of Chicago, Professor of Neurology.

Dr. J. C. Litzenberg, University of Minnesota, Professor of Obstetrics and Gynecology.

Dr. John A. Kolmer, Temple University, Professor of Pediatrics.

Dr. Erwin R. Schmidt, University of Wisconsin, Professor of Surgery.

Dr. Harry L. Huber, University of Chicago, "Allergy and the General Practitioner."

Dr. Lester Wieder, Milwaukee, "Common Fungus Dermatoses."

The Andrew Biddle Oration

Dr. S. Marx White, Minneapolis, Professor of Medicine, University of Minnesota, ex-President American College of Physicians.

The profession of Sault Ste. Marie has arranged a program for your off hours which guarantees interest and enjoyment. Play golf if you like in America and in Canada. See the beauties of the St. Mary's River with its famed falls and rapids. Renew your early American History by visualizing an historical area, and if or when tired, just sit and watch the big ships pass through the locks.

Make your reservations immediately through Doctor G. A. Conrad, chairman of the Hotels Committee at the Soo, or directly to the Ojibway Hotel on the American or the Windsor Hotel on the Ontario side.

OUR EDITOR HONORED

On June 12, 1935, an honorary degree of Master of Arts in Literature and Medicine was conferred on our editor.

"JAMES HERBERT DEMPSTER, Physician, A.B. 1899, Queen's University, Kingston, Ontario, M.D. 1909, Detroit College of Medicine.

"For his literary accomplishments in the field of medicine and medical history as shown in the various books and monographs he has written as well as in his contributions as editor to the JOURNAL of the Michigan State Medical Society, for his many years of teaching, and for the inspiration he has given to so many Detroit young men, the Detroit Institute of Technology confers on Dr. Dempster the degree of Master of Arts in Literature and Medicine."

The above citation well expresses the opinion of Dr. Dempster's many friends in state and country—friends who appreciate his ability, admire his philosophy of life and are proud to call him friend.

A SUPPLEMENT TO "AS THE MATTER NOW STANDS"*

Michigan Crippled Children Commission
458 Hollister Building
Lansing, Michigan

July 19, 1935

To the Supt. of Approved Hospitals:
Under Act No. 274 of 1913, as amended.

IMPORTANT NOTICE
Re: Changed Fee Rates

Dear Superintendent:

Afflicted Children

The Michigan Crippled Children Commission finds that the legislature of 1935, in the passage of Act No. 94 (Senate Bill No. 277) has created a financial emergency by making no additional appropriation to provide for the additional costs which will have to be paid out of the appropriation, "Medical Care of Children." The Commission has held a series of meetings in the last month trying to find some solution to this problem which is just to all parties concerned. None seems to be available.

Therefore, in order to try to keep the service to Afflicted Children available until the legislature can remedy the present emergency situation, we are suspending the use of our Fee Schedules "A" and "B" indefinitely.

Beginning with July, 1935, bills, you will please bill the Auditor General for Afflicted Children as follows:

Temporary Schedule "A" for Physicians and Surgeons: A flat rate of $1.00 per case regardless of the diagnosis, the treatment or operation rendered, or the length of time the patient remains in the hospital.

Temporary Schedule "B" for hospitals on the approved list of the American College of Surgeons: A flat rate of $4.00 per day to include all services.

For all other hospitals approved by the Commission: A flat rate of $3.25 per day to include all services.

Note: A hospital charge limit of $12.00 will be allowed for tonsillectomy and of $8.00 for circumcision.

The letter sent you by the Commission on June 10, 1935, concerning these rates contained a temporary fee schedule "A" for physicians and surgeons which was effective for state cases in the hospital only between May 29, 1935, to June 30, 1935, inclusive.

No change has yet been made in the Fee Schedules "C" and "D" for crippled children under Act No. 236 of 1927.

Respectfully submitted,
MICHIGAN CRIPPLED CHILDREN COMMISSION,
Per HARRY H. HOWETT, *Secretary-Treasurer.*

**See July Journal.*

COUNTY SOCIETIES

MONROE COUNTY

On May 23, 1935, Monroe County Medical Society entertained the Lenawee, Washtenaw, and Livingston County Societies at the annual district post-graduate conference. The committee in charge of arrangements were Doctors R. J. Williams, M. A. Hunter and W. W. Bond.

The scientific session was held at the Masonic Temple, Monroe, beginning at 2 P. M. In the absence of President J. J. Siffer, Dr. P. D. Amadon, vice president, presided. The program was as follows: Dr. John L. Law, "The Care of the Child from Infancy to School Age"; Dr. J. H. Maxwell, "Recognition and Management of Accessory Sinus Disease"; Dr. Stanley Goldhammer, "Diseases of the Blood and Blood-forming Organs." All the speakers were from the University of Michigan. Dr. Goldhammer took the place of Dr. Raphael Isaacs, who was unable to be present. There was an attendance of about forty at this session.

At the time of the scientific session, the doctors' ladies met at the Monroe Country Club, some playing bridge and some golf. Mrs. J. J. Siffer was in charge of this social meeting.

At 6:30 P. M., the doctors joined the ladies at the Country Club for dinner. A delicious meal was served. The Monroe County Society furnished beer, which was served before, during and after the dinner.

The speaker of the evening was Dr. Howard McCloskey (Ph.D. of the Department of Psychology, Ann Arbor), who spoke on "Growing Up Emotionally." Dr. McCloskey's talk was received very enthusiastically.

There were fifty members and guests present for the dinner and the evening.

FLORENCE AMES, M.D.,
Secretary.

HOUGHTON COUNTY

The Houghton County Medical Society held its regular monthly meeting June 4, with a large attendance. The meeting was interesting and instructive, being devoted to the presentation of two papers. Dr. Alfred La Buie read a paper and presented cases on the subject of "Gastro-intestinal Surgery." Dr. H. M. Joy presented a paper on "Undulant Fever" and reported a case under treatment.

The July meeting of the Houghton County Medical Society was held at the Miscowaubik Club, Calumet, Tuesday, July 2, 1935, at 8:30 P. M., with a dinner preceding at 6:30 P. M. Dr. Vernon L. Hart of Minneapolis, Minnesota, was the speaker of the evening and presented the subject "Mechanical and Physiological Rest in the Treatment of Diseases and Injuries of the Extremities."

W. T. S. GREGG,
Secretary.

POST GRADUATE CONFERENCE

The 13th Councilor District held a Post Graduate Conference at The Hotel Perry, Petoskey, Michigan, July 11, 1935, with a gratifying attendance and the following program:

Cancer of the Gastro-intestinal Tract—Frederick A. Coller, M.D.

Anemia—Cyrus C. Sturgis, M.D.

Tumors and Cysts of the Head and Neck—A. C. Furstenberg, M.D.

Medical Education and Economics—J. D. Bruce, M.D.

MICHIGAN'S DEPARTMENT OF HEALTH

C. C. SLEMONS, M.D., Dr.P.H., Commissioner
LANSING, MICHIGAN

New Members of State Council of Health

Two new members have been appointed to the State Council of Health by Governor Fitzgerald. E. A. Schilz, M.D., of Grand Ledge, succeeds William E. McNamara, M.D., and U. G. Rickert, D.D.S., of Ann Arbor, succeeds Chalmers J. Lyons, D.D.Sc., deceased. Dr. Schilz is a practicing physician, and Dr. Rickert is Professor of Materia Medica, Therapeutics, and Hygiene, in the School of Dentistry at the University of Michigan.

Another Lesson in Typhoid

Although the incidence of typhoid fever has been so decidedly on the downward trend for a generation, yet in spite of this the disease continues and its complete eradication is difficult. At the present rate of decline it has been estimated that in another 25 years typhoid may become so rare that there will occur years with no cases.

The present death rate of typhoid fever in Michigan is approximately one per 100,000 and the number of cases reported for several years varies from 300 to 500. Outbreaks more or less extensive continue to appear at intervals. Sometimes the occurrence of an outbreak in a community usually (but not always) teaches that community a lesson, but such outbreaks occur so seldom in any one community that it is hard for all of the state to profit thereby.

There has recently occurred a small outbreak of 8 cases of milk-borne typhoid in a Detroit suburban area. A farmer whose entire milk trade consisted of three families was found to be a typhoid carrier after typhoid had appeared among his customers. In the four families, including the customers and the farmer's own household, there occurred the eight cases of typhoid. It is hardly necessary to say that the milk was not pasteurized. Another lesson to be gained from this incident is that the farmer has for a year or more displayed a sign in front of the house advertising his milk to tourists.

Another group of 8 cases of typhoid occurred recently in a different locality. All of these were in one family or their close relatives and seven of them appeared to be secondary cases infected by the first case. There certainly is little excuse for such an outbreak. Nevertheless we cannot place all of the blame on any one individual but rather a number of individuals are at fault together with failure on the part of the public to recognize the need of an efficient health department. The first case did not receive medical attention promptly. It was not diagnosed nor were the secondary cases diagnosed early. There was no prompt reporting of the circumstances to the local health officer or the State Health Department. There was no full-time or trained epidemiologist as a local health officer and consequently no adequate attention given to the outbreak until it finally came to the notice of the Michigan Department of Health. It is much better for physicians to report suspected cases to the local health officer, which cases may later be proved to be something other than typhoid. Any efficient health officer will be glad to have suspects reported and will not consider such as cases except to take precautionary measures until the diagnosis is established.

Typhoid incidence is greatest from August to October. It is particularly at this season of the year that physicians should be on the alert.

COMMUNICATIONS

To the Editor, Journal,
Michigan State Medical Society:

Our attention has been drawn to the May issue of your valuable journal and particularly to an article on page 268 by Dr. Lewellys F. Barker of Baltimore, Md.

While it is hardly within our province to query the conclusions of a medical man, we do, however, take the exception to statements Dr. Barker makes on page 275 which we regard not only as tendencious, but as definitely anti-Semitic propaganda. The statement regarding inferior children in New York is certainly most misleading. Dr. Barker states that the majority of the defectives and chronic treatments in the wards of the Department of Welfare are the offspring of foreign born parents. He neglects to state that in New York City the majority of all children are of foreign born parents. The World Almanac for 1935 gives the number of families as of 1930 as 1,722,954. Of these, 708,941 are native born and 932,829 are foreign born. Obviously, the majority of children in New York, therefore, are the offspring of foreign born parents. Therefore, Dr. Barker's statement seems to us wilfully misleading, while his further statements regarding the blond Nordic race and its superiority are exactly in line with those of the Hitler government, although disputed by leading scientists the world over.

We draw your attention to these facts because we believe that you would not countenance your valuable journal being made a vehicle for propaganda of this character.

G. E. HARRIMAN
Executive Secretary
Non-Sectarian Anti-Nazi League
New York, June 24, 1935

NOTE: A copy of this letter was sent to Dr. Barker, but when it reached his office, he was absent on a protracted visit to South America. We have re-read the portion of Dr. Barker's paper to which Mr. Harriman alludes, and would say that we have failed to find in it what we would call "anti-Semitic propaganda," or anything "willfully misleading." Neither Dr. Barker (he will be given an opportunity to speak for himself later) nor the editor shares in such propaganda as mentioned in this letter, and the editor, almost needless to say, regrets that any statement in Dr. Barker's paper might be so construed.—THE EDITOR.

Detroit, Michigan
July 22, 1935

Editor, JOURNAL MICHIGAN STATE MEDICAL SOCIETY:

I have before me an editorial entitled "Testimony and Malpractice" as contained in the July 15th issue of the JOURNAL. I assume this excellent article comes from your pen and I am, therefore, desirous of requesting reference privileges for future use. Members of your profession will do well to thoroughly absorb the contents of the last two paragraphs.

LANGLEY E. SMART.
Aetna Life Insurance Company

GENERAL NEWS AND ANNOUNCEMENTS

TO ANNUAL MEETING

By train to the Soo—Western Michigan.
Pennsylvania Railroad

Kalamazoo	8:50 P. M.
Grand Rapids	10:35 P. M.
Cadillac	1:45 A. M.
Arrive Mackinaw	7:25 A. M.
Sault Ste. Marie	12:35 P. M.

Through cars to the Soo if 12 or more.

Round trip rates.

Fare from Grand Rapids and return, $14.50.

To guarantee a through car, early reservations must be made through State Secretary, or Mr. A. E. Butin, Penn. R. R., Grand Rapids.

SPECIAL BOAT CRUISE TO STATE SOCIETY MEETING

Physicians from the southerly part of Michigan will be able to go to the Annual Meeting of the Michigan State Medical Society at Sault Ste. Marie on a special chartered boat from Detroit, according to plans of the Wayne Delegates.

The proposed schedule is to sail from Detroit on Saturday, September 21, at 8:00 P. M., and arrive in Sault Ste. Marie, Sunday, September 22, between 5:00 and 6:00 P. M., in plenty of time for the first session of the House of Delegates, which will meet Monday at 3:00 P. M. The House of Delegates will run through Tuesday, and the first general session will be Tuesday evening at 8:00 o'clock. The cruisers will stay for the other three general sessions, Wednesday morning, Wednesday evening and Thursday morning and will set sail for home Thursday, September 26, at noon, arriving in Detroit Friday, September 27, at 10:00 A. M., in plenty of time for work.

The S. S. Hamonic of the Canada Steamship Lines, Ltd., has been offered for this service to the Committee on Chartering Boat, composed of Dr. C. F. Brunk, Chairman, Drs. B. L. Connelly, H. B. Dibble and W. R. Clinton.

The rates are $57.50 per capita, which includes transportation, all meals during the six days, stateroom accommodations on the trip and during the stay at Sault Ste. Marie—in other words, the boat will be your hotel at Sault Ste. Marie. Full ship entertainment will be offered on the trips up and back.

Physicians from the southerly part of Michigan, their wives and families are invited and urged to consider this cruise. It offers a leisurely way to reach Sault Ste. Marie, comfortable accommodations, good fellowship—in all, a pleasant and economical vacation. A guarantee of 200 people is necessary, so we invite and urge all who may be interested to write to the Committee on Chartering Boat, 4421 Woodward Avenue, Detroit, for full information and particulars, or contact Mr. Dave Keddie, Canada Steamship Lines, 419 Dime Bank Building, Detroit, Michigan—Telephone Cadillac 8563.

There is a good location open in a small town in Western Michigan. See the Classified Advertisements in this issue.

* * *

The sixth annual Golf Tournament of the Wayne County Medical Society will be held at Oakland Hills Country Club on Wednesday, August 28.

* * *

The officers of the Detroit Pediatric Society for the year 1935-1936, elected at the annual meeting held June 19, 1935, are as follows: President, Dr. Edgar E. Martmer; vice president, Dr. Edward A. Wishropp; secretary, Dr. W. J. Scott; treasurer, Dr. Wm. S. O'Donnell.

Meetings are held the first Wednesday of each month, September to June (inclusive), at the Wayne County Medical Society Building, at 8:30 p. m.

* * *

Dr. Walter Parker of Detroit was awarded the honorary degree of Doctor of Science at the June commencement at the University of Michigan. Dr. Parker is a graduate of the University of Pennsylvania and was similarly honored by his alma mater a few years ago. Dr. Parker was Professor of Ophthalmology at the medical school of the University of Michigan for many years. He is now professor emeritus. The honorary degree is well merited, for Dr. Parker has been for many years among the leaders of his specialty in America.

* * *

On July twenty-seventh, the regents of the University of Michigan made a significant appointment to the staff of the Medical School. Dr. Bradley M. Patten, present assistant director of medical sciences of the Rockefeller foundation, will come to the University in the fall as professor of anatomy and director of the anatomical laboratories to succeed the late Dr. G. Carl Huber, who died last December. Dr. Patten, who is forty-six and the son of the well known zoölogist, Professor William Patten of Dartmouth, was formerly a member of the anatomical staff at Western Reserve University, Cleveland. He is an active investigator in embryology and has written two widely used textbooks: one on the embryology of the chick, the other on the embryo pig. His investigations have been concerned chiefly with the development of the heart, the initiation of the heart beat and the changes of the vascular system at birth.

* * *

Dr. Duncan A. Cameron of Alpena observed a half century of medical practice on July 19. Dr. Cameron is well and favorably known to the physicians of Michigan. He was democratic representative of the state legislature in 1933 and 1934. Dr. Cameron went to Alpena when he was twenty-one years old, after graduating from McGill University. A half century ago, Alpena was the center of the lumber industry, which has since practically vanished. Nine years ago, a celebration was held in Dr. Cameron's honor during a "Home Week" celebration. Over 1,200 persons at whose birth Dr. Cameron had officiated marched in procession. This JOURNAL congratulates Dr. Cameron on his fifty years of faithful service.

* * *

Indigent Afflicted Children

At this time we can report that the Executive Committee of the Council of the Michigan State Medical Society are arranging a round table discussion to review the legislation passed in the last legislature and its effect upon medicine. It is understood there are many difficult situations that have arisen; these will be discussed and an early solution is expected. One of the subjects to be brought up is the effect of Act No. 94 of 1935 (Bill No. 277, the amendment to the Afflicted Child Act involving the care of Afflicted Indigent Children) upon the professional fees of the physician. With the passage of Bill No. 277 the responsibility of the payment of the physician passed from the County to the State. The transportation expense passed from the State to the County. This latter situation tends to keep Afflicted Indigent Children in their own county. Thus the local physician should be taking care of these cases in his own community. He is. But he is being paid only one dollar per case by the State because no appropriation was placed in Bill No. 277, by which money can be obtained to pay the physician (a reasonable fee). This ridiculous fee of one dollar per case is being paid until such a time when an appropriation be made to take care of the expense involved.

* * *

Upper Peninsula Medical Society

The annual meeting of the Upper Peninsula Medical Society will be held at Iron Mountain, August 15 and 16. The meeting will be opened with the address of the president, Dr. F. G. Maloney. The remainder of the program is as follows:

Thursday, August 15.—Differential Diagnosis of Lesions of the Alimentary Tract from Standpoint of X-ray, Dr. Fred Hodges, Professor of Roentgenology at University of Michigan; Conduct of First and Second Stage of Labor with Special Reference to Analgesia and Anesthesia, Dr. Norman Miller, Professor of Obstetrics and Gynecology at University of Michigan; Sacro-Iliac Strain, Dr. Reginald Jackson, Madison, Wisconsin; Medicinal Treatment of Peptic Ulcer, Dr. Grant Laing, Chicago, Ill.; Acute Infections of Mouth, Throat, Nose and Neck, Dr. A. C. Furstenberg, Dean of Medical Department of University of Michigan; Fever Therapy, Dr. H. P. Doub, Ford Hospital, Detroit: Medical Legislation, Dr. James D. Bruce, Head of Medical Extension Department at University of Michigan.

Friday, August 16.—Injection Treatment of Hernia, Dr. W. H. Alexander, Iron Mountain, Mich.; Toxemia of Burns, Dr. G. I. Allen, Ford Hospital, Detroit; Disease of Prostate, Dr. G. J. Thompson, Mayo Clinic; Allergic Disease, Dr. F. W. Gaarde, Mayo Clinic.

OF GENERAL MEDICAL AND SURGICAL INTEREST

THE DIAGNOSIS OF EARLY CANCEROUS CHANGES IN PEPTIC ULCER

Arthur L. Bloomfield, San Francisco, studied the gastric secretion in ninety-two consecutive cases of cancer of the stomach. Twenty-two cases of cancer with acid were carefully analyzed to see what evidence existed that acid gastric secretion in the presence of cancer indicates that the growth has arisen on the basis of peptic ulcer. The conclusions are based on history, on roentgen examinations and on necropsy or operative material. In nine of the twenty-two cases it could definitely be said that benign ulcer preceded the cancer, and in six more this

was highly probable. In five cases no conclusion could be reached and in only two was it certain that no ulcer had existed. In most of this group of cases with preservation of gastric secretion peptic ulcer was the initial event. As a control, a series of twenty-two consecutive cases of cancer with anacidity were analyzed in the same way and in not a single case was there proof of preceding ulcer and in all but four it was certain or probable that the cancer was not on a basis of ulcer. The observations support the view that there are two types of cancer of the stomach, which differ in their pathogenesis: (1) cancer arising in stomachs the seat of chronic gastritis with anacidity and (2) cancer arising in peptic ulcer. The former is the usual variety; it comprises from two-thirds to three-fourths of the cases. The presence of acid is the crucial factor in the diagnosis of cancer ex ulcere. The author also considers the symptomatic response to therapy, roentgen examination, the size of the ulcer, the age and sex of the patient and the length of the history as available data for a so-called early diagnosis of carcinomatous gastric ulcer. It is impossible by clinical observation to determine early cancerous changes in apparently benign peptic ulcer. The various criteria, while statistically valid, are subject to so much variation that they cannot be depended on in the individual case even though the great size of the lesion points strongly to cancer. Hence, if prophylactic surgery is to be used, one should consider every gastric ulcer as possibly malignant if not in fact, and one should excise them all. But the surgical risks of such wholesale gastric resection are distinctly greater than the hazard of ulcer being or becoming malignant. The only practical attitude to adopt, therefore, is to regard small, apparently innocent gastric ulcers as in fact benign until evidence to the contrary is weighty enough to arouse serious suspicions, and to accept the fact that a certain number of unavoidable tragedies will occur. They will occur in the future as they have in the past, not necessarily because physicians are careless but because they are helpless in the face of an insoluble problem of diagnosis. (*Journal A. M. A.*, April 6, 1935.)

CARCINOMA OF RECTUM: SOME CAUSES FOR POOR PROGNOSIS

A careful analysis of the answers obtained from 200 patients has led J. Arnold Bargen and Eugene T. Leddy, Rochester, Minn., to conclude that the poor prognosis of carcinoma of the rectum is the result of: 1. The frequent wasting of valuable time on the part of patients by self diagnosis and self treatment, and by regarding the symptoms as unimportant. 2. Delay by the physician to make a digital examination of the rectum. 3. Lack of knowledge, on the part of the patient, concerning the safety and satisfactory end-results of rectal surgery. Symptoms of carcinoma of the rectum simulate those of other benign lesions and even those of functional conditions. Temporization and mismanagement cannot be too strongly condemned, for they will place many patients beyond all hope of cure and relegate them to palliation and hopelessness. I doubt exists about any given lesion or group of symptoms, the lesion should be considered carcinoma until it is proved otherwise. The fallacy that rectal symptoms should be considered and treated as functional upsets is perpetuated unfortunately by the exploiters of nostrums, and the physician is forced to compete with those who effer free medical advice for pecuniary reason only. The patient, who lacks discriminating sense, therefore treats his symptoms but not the underlying lesion until he becomes convinced, by his own failure to relieve himself, that medical advice is highly desirable. As carcinoma of the rectum can nearly always be diagnosed with the index finger, it is lamentable that so many patients who are afflicted with this condition do not consult a physician until it is too late to secure the greatest benefit. (*Journal A. M. A.*, April 6, 1935.

CORONARY ARTERY THROMBOSIS WITH PERICARDIAL EFFUSION

A. M. Master and Harry L. Jaffee, New York, cite two cases in which the evidence appears fairly conclusive that the pericardial effusion was due to an acute coronary artery occlusion. In the first case, a man, aged 60, an acute illness was present with a previous history of syphilis but no evidence of rheumatic fever or rheumatic heart disease. There was also no reason to consider the diagnosis of tuberculosis. On the other hand, the history was typical of coronary artery thrombosis in a patient with arterial hypertension. A roentgenogram and pericardial rub were proof of a pericarditis with effusion. In the second case, a woman aged 57, the question arose during her hospital stay whether or not the lung signs were those of pneumonia, and hence whether the pericarditis with effusion was a complication of the pneumonia. Pain over the chest, even in the precordial region, may be present in a patient suffering from pneumonia. Clinically, however, the patient's course was not that of pneumonia. Further proof that coronary artery disease was the basis of her trouble was observed when she returned to the hospital for reëxamination. She complained of precordial pressure following the slightest physical exertion. The electrocardiogram corroborated the diagnosis, for it still showed evidence of myocardial damage. It may be thought that instead of a pericardial effusion a hemopericardium occurred. This is hard to disprove completely, as the patients survived and paracentesis was not performed during life. However, the course in hemopericardium is usually rapid and fatal. (*Journal A. M. A.*, April 6, 1935.)

TREATMENT OF DIABETES WITH INSULIN (AFTER TEN YEARS): CONTRASTING EFFECTS OF NORMAL AND OF OLDER DIABETIC DIETS

H. Rawle Geyelin, New York, summarizes the results of treatment in a group of 150 cases of diabetes treated with insulin and a high carbohydrate diet during the past ten years. Patients treated with high carbohydrate low fat diets achieve greater effectiveness of insulin as judged by the ratio of units of insulin to grams of carbohydrate oxidized. The administration of such diets overcomes hypercholesterinemia. In the majority of instances, blood sugar levels are reduced after the administration of high carbohydrate diets. Hyperinsulinism is less common and less severe. Complicating conditions such as tuberculosis, gangrene and cardiovascular disease are less common when patients are being treated with the high carbohydrate diet (normal calories). Aften ten years of application of the high carbohydrate diet, the majority of patients show no loss of food tolerance or any other demonstrable retrogression of the diabetes. (*Journal A. M. A.*, April 6, 1935.)

SHORT WAVE DIATHERMY: PRELIMINARY REPORT

Frank Hammond Krusen, Philadelphia, believes that before short wave and ultra-short wave diathermy machines are used extensively: 1. They should be improved in construction, and the manufacturers should specify definitely the wavelengths of the apparatus and their output in watts. 2. Fire hazards

should be eliminated. 3. An accurate method of measuring dosage should be perfected. 4. More data concerning the physiologic effects of the waves they produce should be amassed. 5. The idea that the apparatus is simple to operate and that treatment may be given through the clothing should be dispelled. 6. The technic of application should be improved so that the danger of burning sensations is lessened. It would seem that with further study by physicists and engineers concerning the proper methods of constructing apparatus, and with further clinical investigation by especially skilled physicians in hospital physical therapy clinics, short wave diathermy may prove to be a useful therapeutic agent. But at the present time many of these devices have not been sufficiently perfected, and it must be confessed that knowledge of the exact physiologic effects of these waves is very limited. Extensive employment of these machines at the present time can lead only to unsatisfactory results and may cause condemnation of a method of treatment that might otherwise be found serviceable. (*Journal of A. M. A.*, April 6, 1935.)

TENTATIVE CLASSIFICATION OF ALLERGIC DERMATOSES

Marion B. Sulzberger, Fred Wise and Jack Wolf, New York, submit an illustration and table that give their suggestion for a schematic and tentative classification of the various common allergic dermatoses. The division is based on the site of the shock tissue (epidermis or cutis) and the length of time required for the development of the visible reaction, after the union of allergen and sensitized tissue. In eczematous, tuberculin-trichophytin-type and urticarial dermatoses the reaction to skin testing is characteristic; this has served as the criterion for classification. Thus the atopic dermatoses, including the clinically apparently eczematoid disseminated neurodermites, are classified under the urticarial group. The fourth group has no characteristic reaction to the skin test and should be considered as including the miscellany of sensitization dermatoses, such as erythema nodosum, multiform erythemas and drug eruptions of various types. It will be seen that this group is heterogeneous, with sensitization as the one common factor. This group, therefore, includes the many as yet unclassified sensitization dermatoses. The classification must be considered a tentative one, because it rests only partially on established facts, the remainder being based on as yet insufficiently confirmed experimental evidence and, in some cases, even as hypothesis. As knowledge of these dermatoses increases, it will doubtless be necessary to modify and change various points. With the rapid progress in the study of allergy, the necessity for such changes may soon become apparent. Nevertheless, it seems to the authors that the table submitted represents a concise and tenable classification of sensitization dermatoses which is not in contradiction to any at present established facts. Such a presentation may prove of aid in the understanding, teaching and further study of these conditions. —(*Journal A. M. A.*, April 27, 1935.)

GLANDULAR PHYSIOLOGY AND THERAPY: THE PHYSIOLOGY OF ESTROGENIC PRINCIPLES

Edgar Allen, New Haven, Conn., stresses the following points in the physiology of estrogenic substances: First, as a major objective, the fundamental endocrine mechanism of the estrous and menstrual cycles has been demonstrated. Active hormones have been isolated and their relation to one another partially worked out. Second, incidental to the first point, the reaction of the rodent's vagina has provided a practicable test for the biologic standardization of therapeutic products, and these have now replaced the inert gland extracts previously in wide clinical use. Third, the extension of the test to carcinogenic substances and to other substances of similar chemical structure from a wide range of sources is extremely important. In description of some of the carcinogenic and estrogenic substances, the time interval required may be considerably greater than that required for the growth phase of the estrous reaction to theelin. The reasons for variations in the time of reaction are not clear. It is not yet known whether some of the related substances included under the term "estrogenic" will produce more than the vaginal growth reaction. Few of them have been tested as to value in replacing other phenomena of estrus or menstrual phenomena in primates.—(*Journal A. M. A.*, April 27, 1935.)

PERIPHERAL VASCULAR DISEASE: ITS SIGNIFICANCE FOR GENERAL PRACTITIONERS AND SPECIALISTS

Géza de Takáts, Chicago, points out that it is no exaggeration to say that thousands of individuals are unconscious or mildly conscious of a progressive interference with their peripheral circulation. Their feet may be pulseless but still in a stage of compensation. Their "rheumatic" pains come and go with changes of weather, mechanical stress or emotional load. An occasional numbness or tingling of the extremities is disregarded. They undergo an annual or semiannual physical examination during which peripheral circulation is ignored, although the heart is carefully examined, chest plates are taken and electrocardiograms are read. As a result, the middle aged wage earner, the insured policyholder, or the railroad or street car conductor suddenly develops a serious interference with the peripheral blood flow. Undoubtedly the general practitioner sees these patients first. Many cases of peripheral vascular disease are also encountered by internists, orthopedic surgeons, traumatic and industrial surgeons, neurologists and dermatologists, whose special field of interest lies somewhat apart from problems of peripheral circulation. The study of peripheral circulation has advanced to a point at which a simple office procedure can be included in the course of a thorough physical examination. The author outlines such methods of examination, evaluates their meaning and indicates the therapy of the most common peripheral circulatory disturbances.—(*Journal A. M. A.*, April 27, 1935.)

TREATMENT OF RHEUMATOID ARTHRITIS WITH FEVER INDUCED BY DIATHERMY

Charles L. Short and Walter Bauer, Boston (*Jour. A. M. A.*, June 15, 1935), employed fever induced by diathermy in twenty-five cases of rheumatoid arthritis. In twenty cases at least temporary improvement was shown, both subjectively, in freedom from pain, and objectively, in increased joint motion and occasionally in decreased effusion and swelling. This improvement was only temporary, and in only five has the gain been maintained to the end of the follow-up period of from more than three years to one year. The number of treatments given each patient varied from one to fifteen, and the usual temperature maintained was 104 F. for four hours. While no patient was seriously injured by this treatment, all looked on it as a harrowing ordeal. When the results obtained are balanced against the severity of the treatment, the authors' conclusion is that in rheumatoid arthritis the use of this method is only occasionally justified and should not be used to the exclusion of general treatment.

THE DOCTOR'S LIBRARY

Acknowledgment of all books received will be made in this column and this will be deemed by us a full compensation to those sending them. A selection will be made for review, as expedient.

THE METHOD OF ACTION OF RADIUM AND X-RAYS ON LIVING TISSUES. By Hector A. Colwell, M.B., Ph.D., M.R.C.P., D.P.H. The Barnato Joel Laboratories, Middlesex, Hospital, London, awarded the Garton Prize and Gold Medal of the British Empire Cancer Campaign, 1934, Oxford University Press, 1935. Price, $5.00.

In view of the ever increasing application of the x-rays and radium in treatment, no timelier study could have been made than this, the results of which are recorded in the present work. The six chapters that comprise the book are (1) The Cell; (2) Chemical Actions of the Radiations; (3) General Effect of Radiation on Cells; (4) The Reticuloendothelial System and Some Immunity Reactions; (5) Radiation and Resistance to Tumor Growth, and (6) The Action of Radiations on Malignant Growths. So important is the animal cell in any study of the action of the x-rays or radium that the author prefaces the work with this chapter which embodies the results of the latest histological research on the subject.

A TEXTBOOK OF CLINICAL NEUROLOGY: By Israel S. Wechsler, M.D., Professor of Clinical Neurology, Columbia University, New York; Attending Neurologist, Neurological Institute and The Montefiore Hospital, New York. Third Edition, Reset. 826 pages with 162 illustrations. Philadelphia and London: W. B. Saunders Company, 1935. Cloth, $7.00 net.

Book reviewing may be approached from two directions, one an attempt to describe the contents so as to give the reader an idea of the scope and character of the author's treatment of the subject; the other, the approach of the critic who sits in judgment over the work. In medicine the former is more acceptable to the general practitioner; the latter appeals to the specialist. This work on clinical neurology is essentially for the general practitioner or the internist. The modern tendency, says the author, is to weave into one texture anatomy, physiology, pathology and symptomatology. This is, of course, the viewpoint of internal medicine. In this third edition, the work which first appeared in 1927 has been brought up to date. The chapters include Methods of Examination, The Peripheral Nerves, The Brain, The Neuroses, and, as an innovation, there is an interesting chapter on the History of Neurology. The book is the embodiment of the author's personal teaching. It is not concerned with controversial topics but confines itself largely to the accepted data on the subject.

THE STORY OF MEDICINE IN THE MIDDLE AGES. By David Reisman, M.D., Sc.D., professor of the History of Medicine and professor of clinical Medicine, University of Pennsylvania; member of History of Science Society and Mediaeval Academy of America. Illustrated; 401 pages. Paul B. Hoeber, Inc., New York, 1935. Price $5.00.

We are all much more familiar with the mythology and history of Greece and Rome than we are about the period of history known as the Middle Ages. This fact will not be so true in the future as it is at the present time, in as much as the so-called "Dark Ages" are coming into their own. They are challenging exploration. This is true in social and political history and is becoming equally true in the history of medicine, with which we are at present concerned. While the middle ages had their superstitions and their wars (we at the present time cannot boast), there was also a great deal of beauty as well as the appreciation of beautiful things. These were the centuries which produced the great cathedrals, that produced the Magna Charta and the beginnings of representative government. Many of the universities that have since become world famous had their origin in the thirteenth century. While the Middle Ages had not been wholly neglected by medical historians, Dr. Reisman's book is the first work in English so far as we know that has emphasized this period of medical history. He brings to the work a mature mind trained by years of study and research not only in medical history but likewise in clinical medicine. Many of the illustrations of Dr. Reisman's "story," most of them in fact, will be found new to the average reader, in as much as they have hitherto been unpublished. Dr. Reisman devotes fifty-four pages to the subject of universities alone, which contains all the matter the average reader of medical history will care to peruse. There are chapters on anatomy, surgery, medicine and the guilds, uroscopy, medieval textbooks on medicine, the lay attitude towards the medical profession in the middle ages, thirty-five chapters in all. A word in regard to the typographical appearance. It is some time since it has been our privilege to review a Hoeber book. Paul B. Hoeber Inc. has won a just reputation in the fine craft of book making. The present story of medicine in the middle ages is fully equal to the publisher's best efforts. The typographical appearance, the format and illustrations are all that even the most fastidious can ask in a book.

Dedication Addresses

We have received a handsome volume de luxe in character bearing the imprint of the Lilly Research laboratories. The dedication of these new research laboratories was described in this JOURNAL earlier this year. The present book gives in full the addresses made by many of the leading medical scientists of the English speaking world. The table of contents is as follows:

Address of Welcome, Mr. Eli Lilly; Comments on Research in Manufacturing Pharmacy, Mr. J. K. Lilly; The Unpredictable Results of Research, Dr. Irving Langmuir; The Early Story of Insulin, Sir Frederick Banting; Chemical Ideas in Medicine and Biology, Sir Henry Dale; Dinner Program with Addresses by Toastmaster, Mr. J. K. Lilly, Sir Henry Dale, Dr. Elliot P. Joslin, Dr. George R. Minot, Dr. Frank R. Lillie, Dr. George H. Whipple, Dr. Carl Voegtlin, Dr. George H. A. Clowes; Program of the Informal Meeting of the Research Group, Chemical Transmission of the Effects of Impulses in the Peripheral Nervous System, Sir Henry Dale; Contributions to the Chemistry of Cell Division, Dr. Carl Voegtlin; Action of Certain Oxidative Stimulants and Depressants on Respiration and Cell Division, Dr. G. H. A. Clowes and Dr. M. E. Krahl; Some New Methods of Studying Monomolecular Films, Dr. Irving Langmuir and Dr. Katharine B. Blodgett; General Description of the Lilly Research Laboratories, Illustrated, J. P. Scott; Directory of the Research and Control Stall, Lilly Research Laboratories.

The Lilly Company is to be commended for preserving the excellent papers in permanent form.